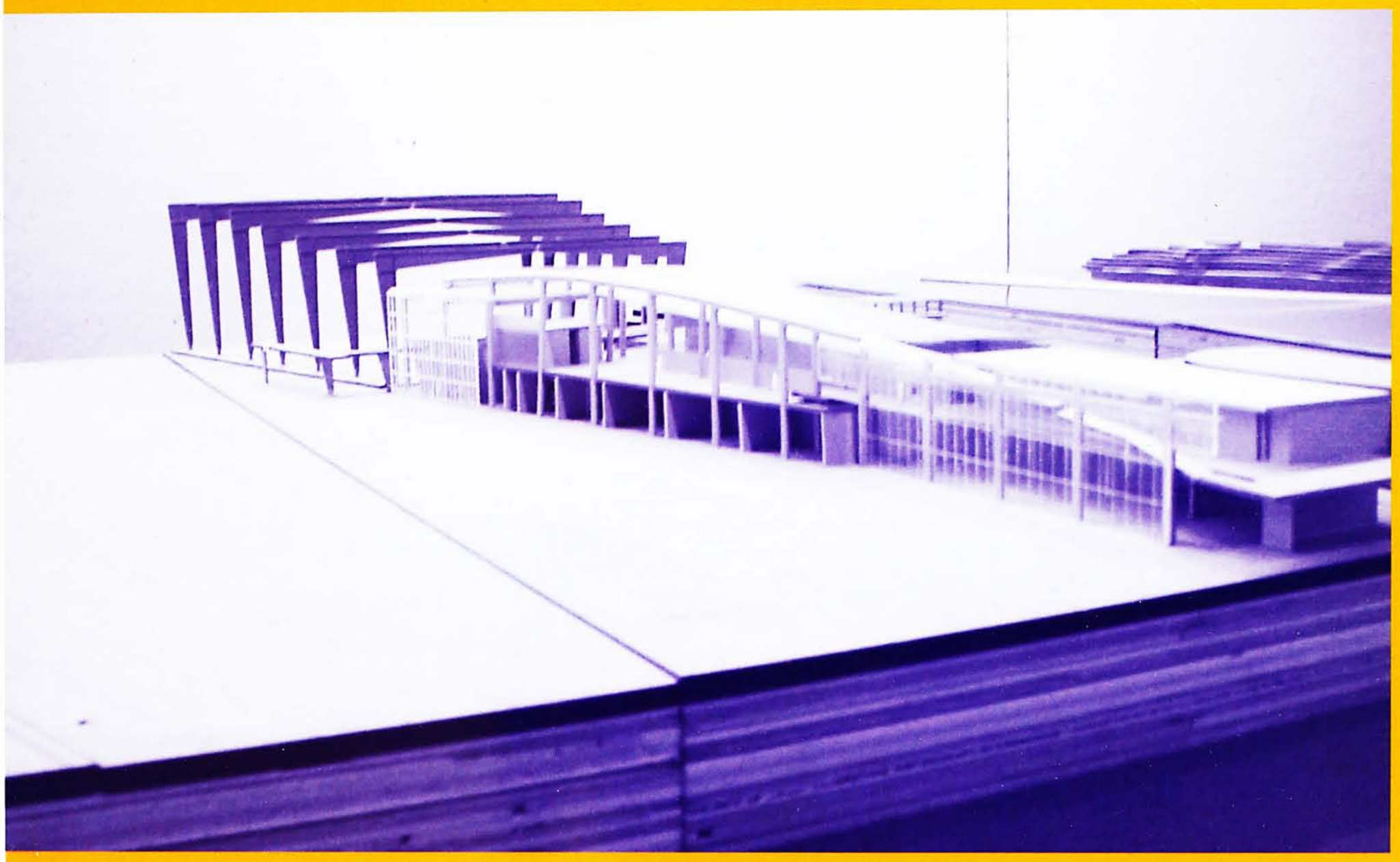
ARCHITECTURE DEPARTMENT **CHINESE UNIVERSITY OF HONG KONG**

MASTER OF ARCHITECTURE PROGRAMME 2001-2002 DESIGN REPORT

EXPERIENCING AVIATION FROM MOTION TO SENSATION

GIANG Tsz Sheung Keith April 2002



Department of Architecture
The Chinese University of Hong Kong
Master of Architecture
2000-2002

DESIGN REPORT

experiencing aviation from motion to sensation
體驗飛行的動與感

Giang Tsz Sheung Keith
姜子尚

JULY 2002

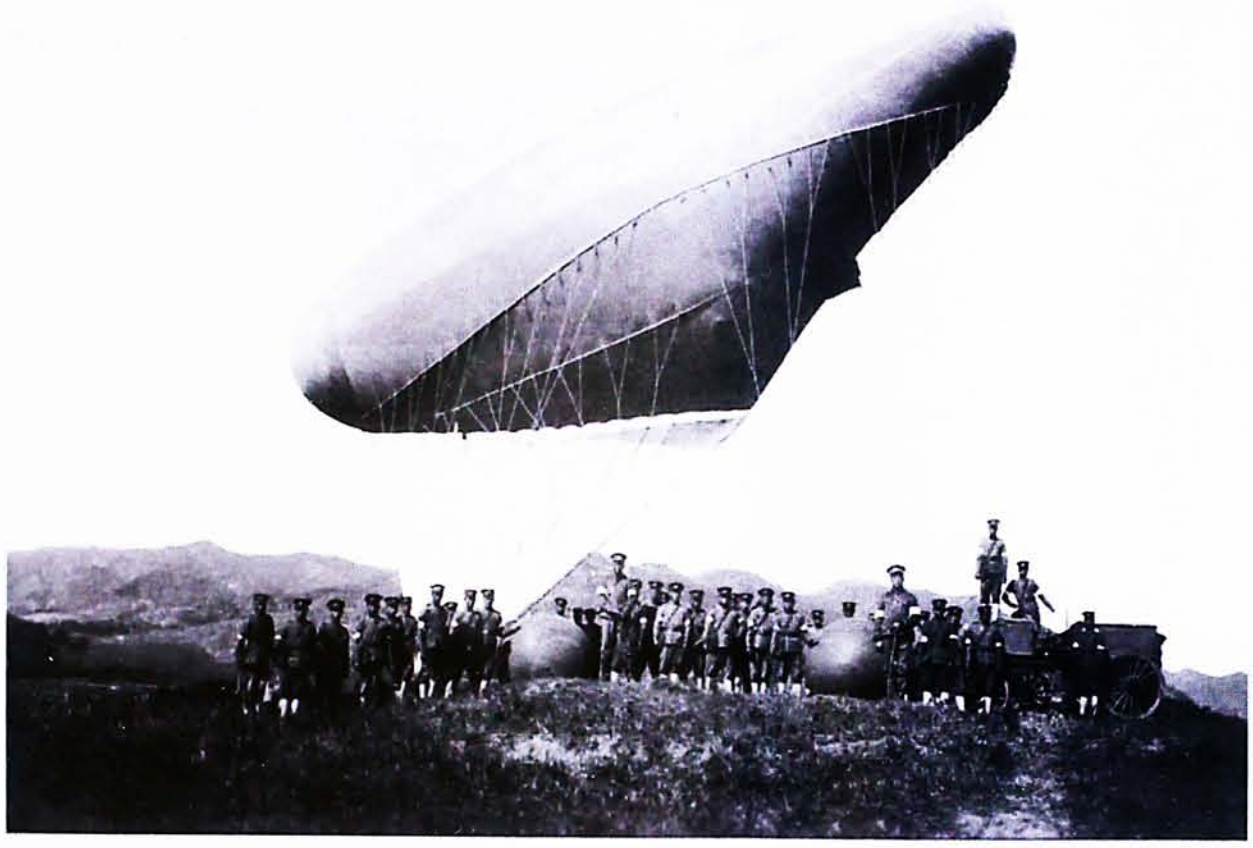
Advisor Prof. Bernard V. Lim

synopsis

Man's desire to fly is one of the oldest and strongest aspirations. Even for today, an airship on Victoria Harbor can still attract us. How we know about the flying motion? The answer is through our senses.

Motion can generate human sensations; space has the role to govern our perception towards those motions. As space design provide a base to set the viewpoint for exploring and experiencing. It contributes to transform the motion to our personal sensations.

I am going to use flying motion as the starting point to design an aviation center for general public and cadet pilot to experience, to sense, to observe and to learn about aviation.



1. Airship participated an autumn practice of Lake Tai in 1908. Photo taken in 1908 光緒三十四年(1908 年)氣球隊參加太湖秋操時的照片; 2. The Pt[30] Flying Ship is categorized as non-rigid airship (also called a 'blimp') and is the most common form nowadays. An airship is an aircraft that derives its lift from a lifting gas (helium) while it is propelled forward by an engine. Their internal pressure of the helium contained within the airship's envelope maintains their shape. The only solid parts are the passenger car and the tail fins. It is also known as a 'lightship' for its ability to light up at night.

content

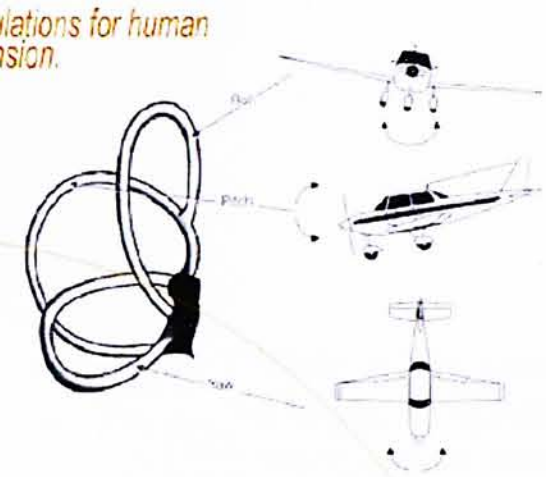
01

Theme & Concept

- Motion and space design
- Space design and sensation
- Motion and Sensation
- From motion to sensation
- From motion…
- Architectural questions

To design space offering new stimulations for human ***to sense the motion*** *in new dimension.*

The reaction is direct and obvious. As we have sensory adaptation mechanism in our body. That is the tendency of sensory systems to response less to stimuli that continue without change. When there is no new information about the environment, the nervous system ignores them. Thus either the change in the form of motion (stimuli), or the change in the perspective of occupants (receptor), the stimulation would remain being altered or fresh.



To use the flying ***motion*** *as the starting point to design space*

When a train passes through the railway along the platform, it changes the space definition. We could make use of those motions to enrich the space design. The spatial quality has been changed in time dimension. Moreover, motion of occupants would have a dynamic relationship with the space definition.

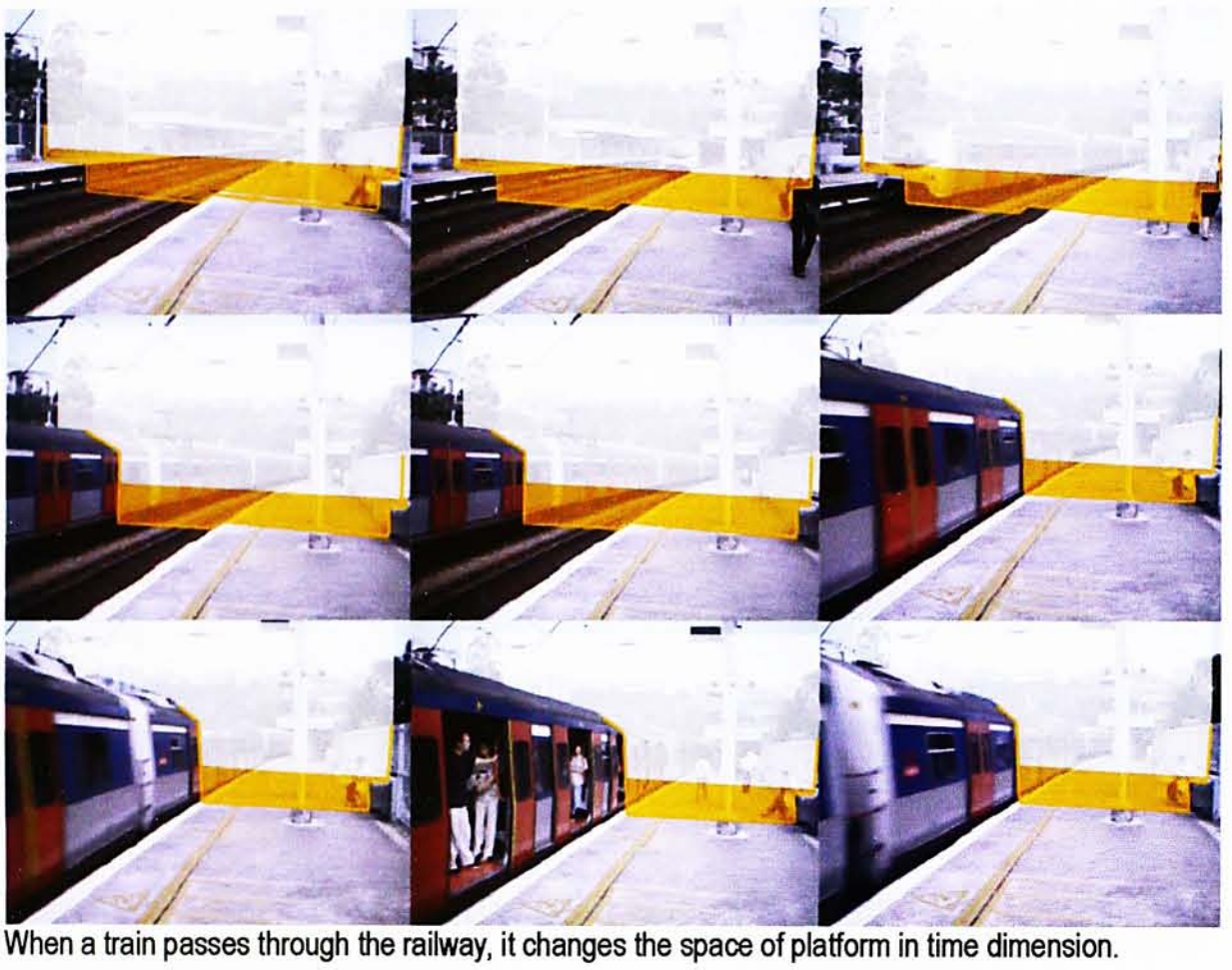
The frame governs the perspective towards the scenery. A space design could govern the sensations.

To design space as an ***interface*** *of inside and outside contributes specific sensation.*

01-1

01theme/concept

Motion and Space Design



When a train passes through the railway, it changes the space of platform in time dimension.

When a train passes through the railway along the platform, it changes the space definition. We could make use of those motions to enrich the space design. The spatial quality has been changed in **time dimension**. Moreover, motion of occupants would have a dynamic relationship with the space definition.

To use the flying motion as the starting point to design space

Motion of an object has an interactive relationship with the space. Moving object is part of space defining element.

Motion - **Space Design** - Sensation

01-2

01theme/concept

Space Design and Sensation

The frame governs the perspective towards the scenery.
A space design could govern the sensations

Human experiences space by their senses.
Vision and audition are the most highly specialized senses in humans, occupying the greatest amount of brain space and showing the most cortical evolution.

To design space as an interface of inside and outside contributes specific sensation.

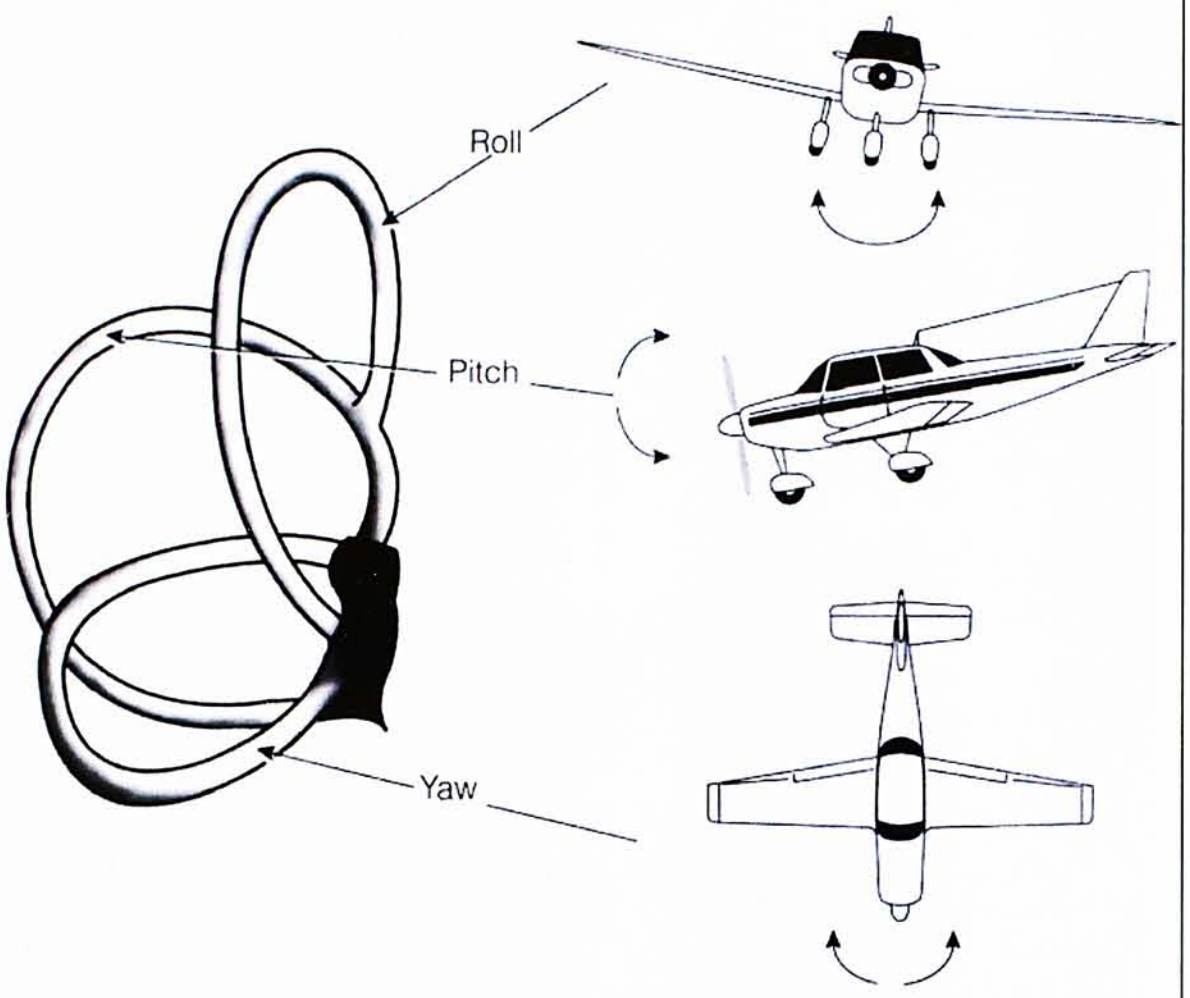
Our other senses, however, serve important adaptive functions. There include smell, taste, the skin senses (pressure, temperature, and pain), and the proprioceptive senses (body position and motion).

Motion - **Space Design - Sensation**

01-3

01theme/concept

Motion and Sensation



Motion would directly stimulate human sensations.

The reaction is direct and obvious. As we have **sensory adaptation mechanism** in our body. That is the tendency of sensory systems to response less to stimuli that continue without change. When there is no new information about the environment, the nervous system ignores them.

Thus either the change in the form of motion (stimuli), or the change in the perspective of occupants (receptor), the **stimulation** would remain being altered or fresh.

To design space offering new stimulations for human to sense the motion in new dimension.

Motion - Space Design - **Sensation**

01-4

01theme/concept

Motions generate tension to space.

To stimulate specific sensation for a certain motion through space design.

From Motion to Sensation

The relationship between static and moving objects is dynamic and inspiring towards space design.

[precedent study]
SIGNAL BOX AUF DEM WOLF
Basel, Switzerland
Herzog & de Meuron

On the edge of railway tracks, there is a tall, copper volume containing the signal box. The building's concrete shell is insulated on the exterior and wrapped with approximately 20cm wide copper strips, which are twisted at certain places in order to admit daylight.
The slits of copper strips offer an **interface** with new dimension to sense the motion of train as well.
Motion could be adapted as a space-defining element and also a driving force for the space design.

Human would sense the motion from certain perspective, and thus the way they sense the motion is governed by the space design

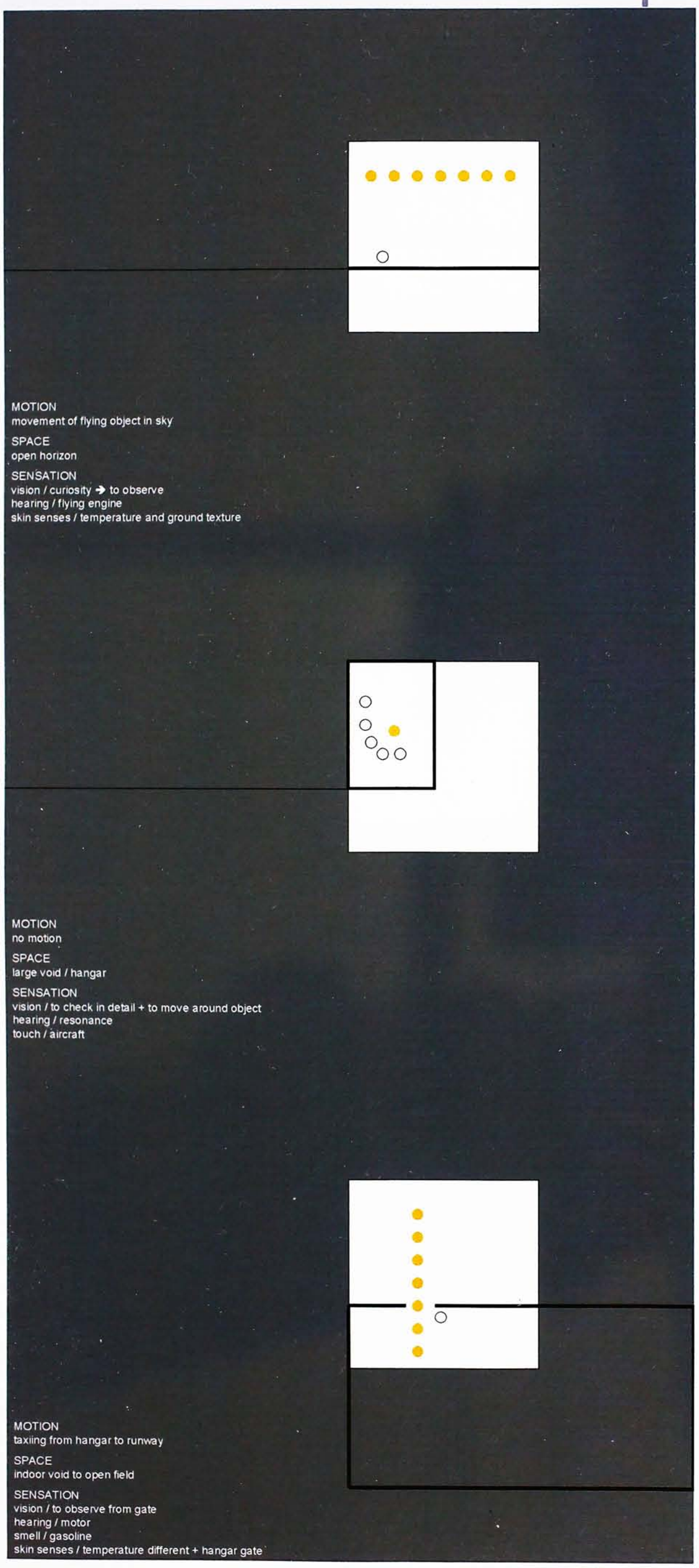
motion → space design → sensation

01theme/concept

from motion...

A Tension of motion and space

Curiosity is one of the motivations of human to explore and to discover. Seeing and being seen are classical relationship among human being as well as human being and objects.

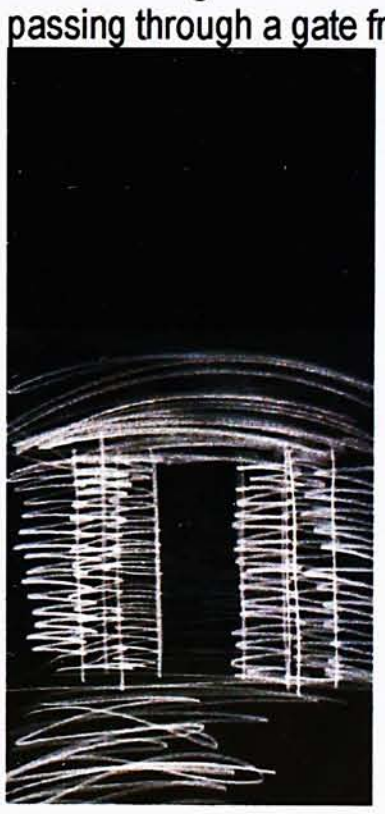


B Interaction between static and moving objects

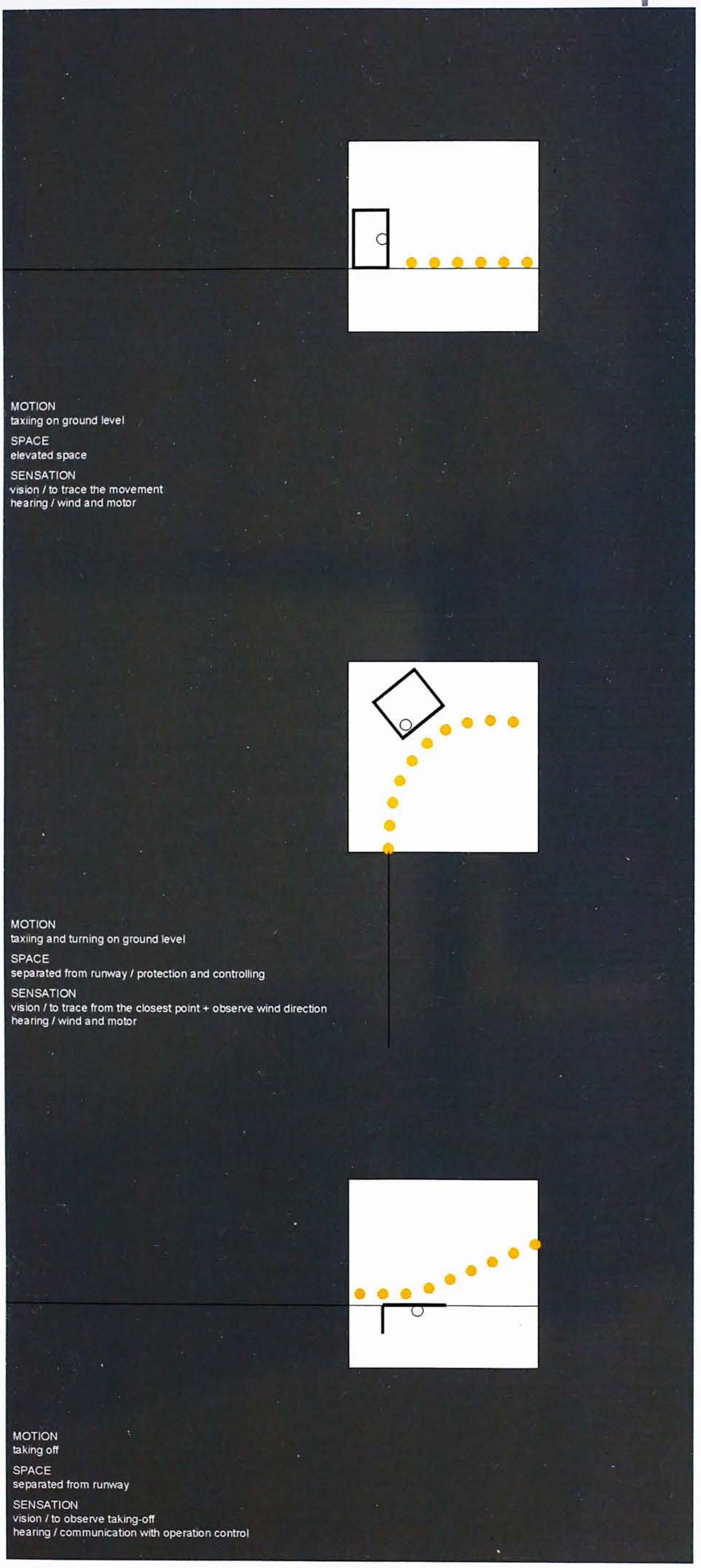
When there is a moving object, human being tends to stay and observe. If the moving object become static, human being like to observe with self-motion instead.

C from hangar to field

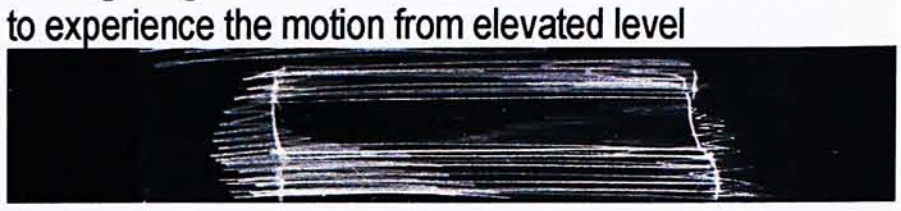
passing through a gate from enclosed to openness



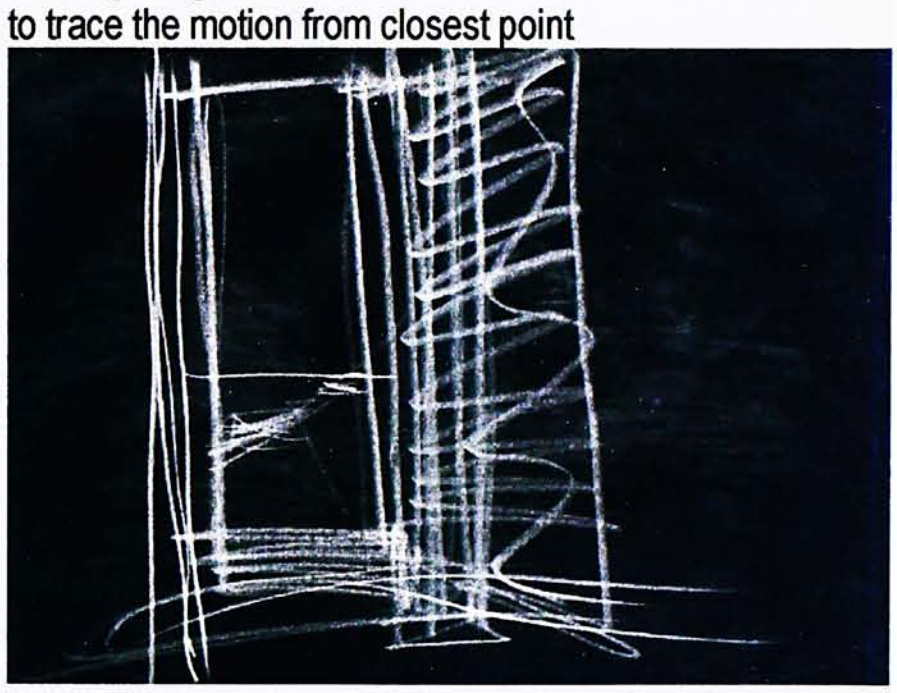
01theme/concept



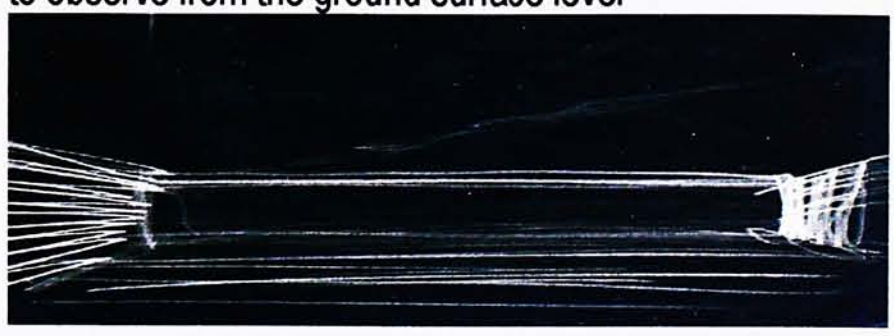
taxiing on ground
to experience the motion from elevated level



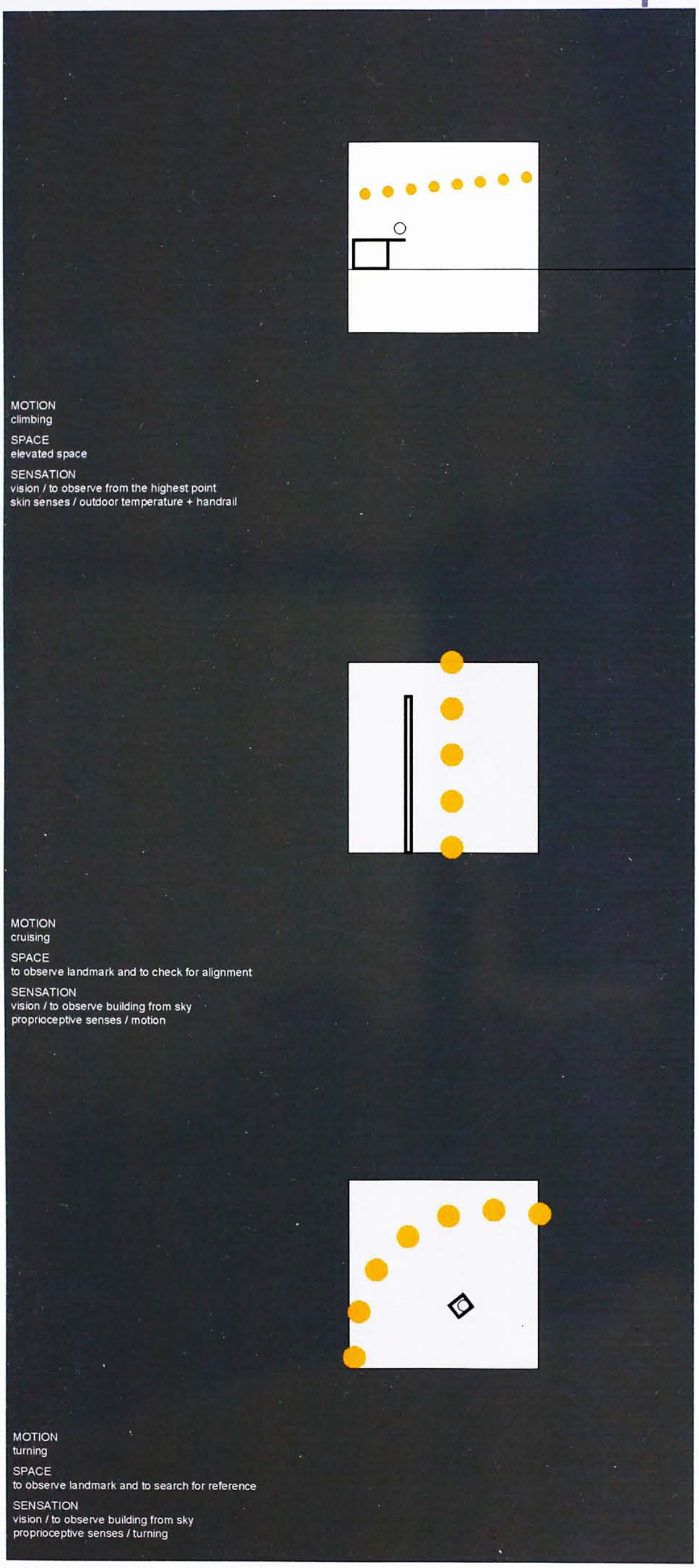
turning on ground
to trace the motion from closest point



taking off
to observe from the ground surface level



01theme/concept



MOTION
climbing

SPACE
elevated space

SENSATION
vision / to observe from the highest point
skin senses / outdoor temperature + handrail

MOTION
cruising

SPACE
to observe landmark and to check for alignment

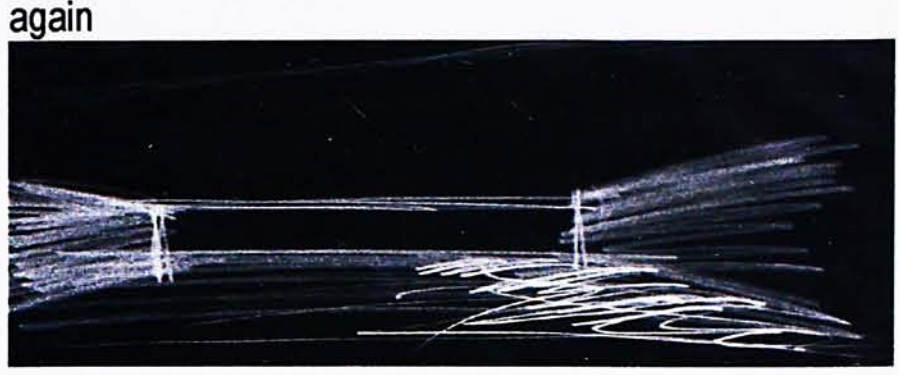
SENSATION
vision / to observe building from sky
proprioceptive senses / motion

MOTION
turning

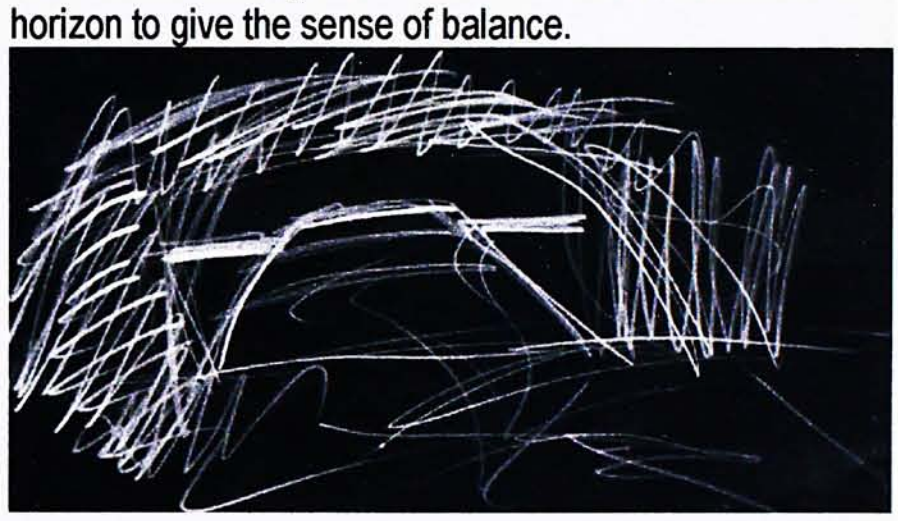
SPACE
to observe landmark and to search for reference

SENSATION
vision / to observe building from sky
proprioceptive senses / turning

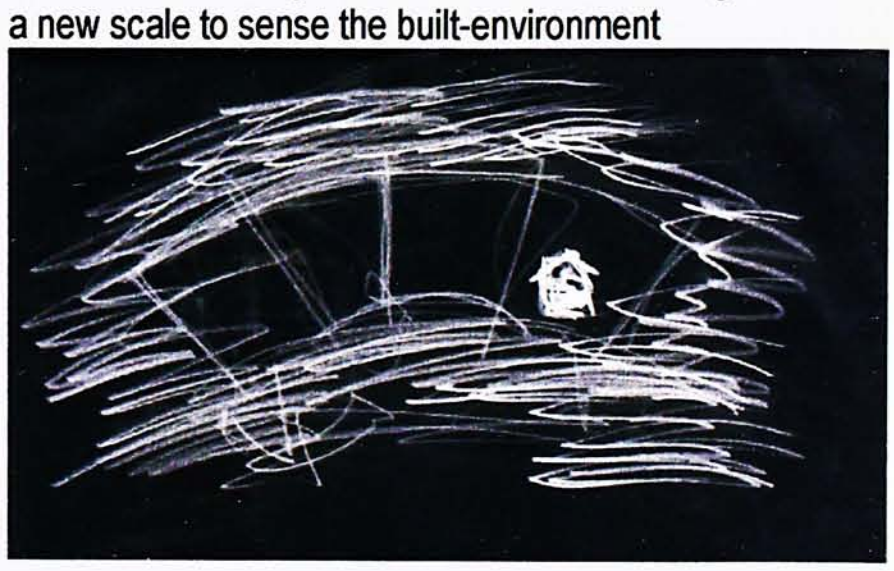
Climbing
to observe the moment of losing contact with earth again



cruising
to observe from sky to find reference for aligning
to observe through a frame and relate with the horizon to give the sense of balance.



turning
to observe from sky to find reference for turning
a new scale to sense the built-environment



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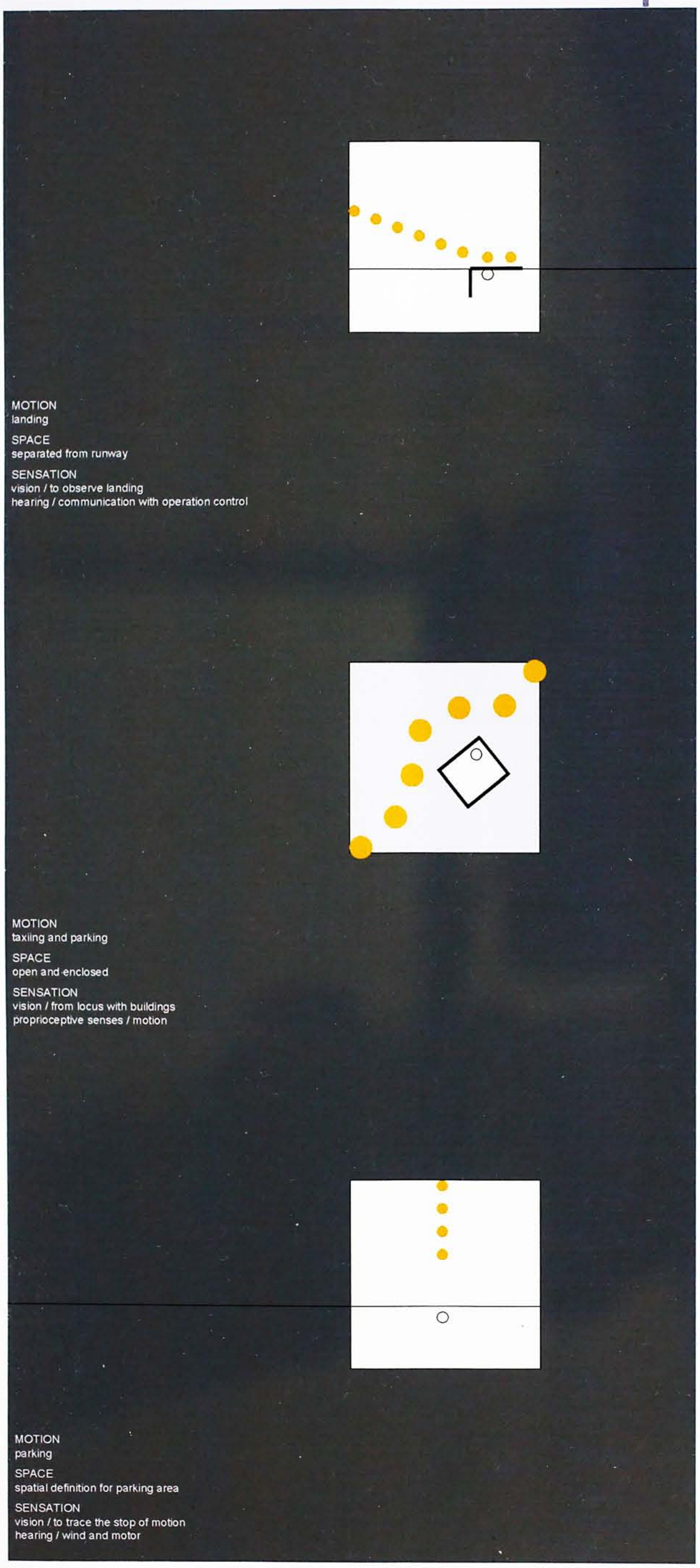
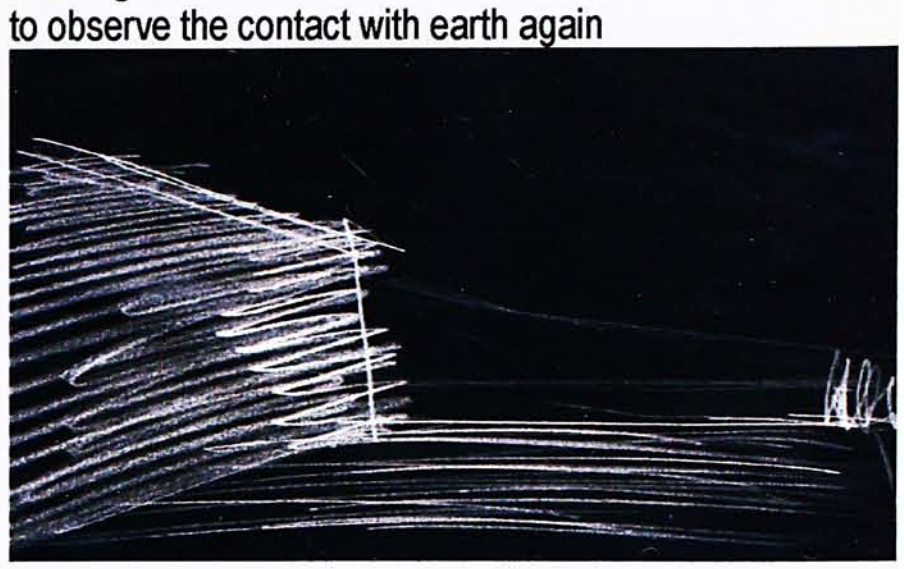
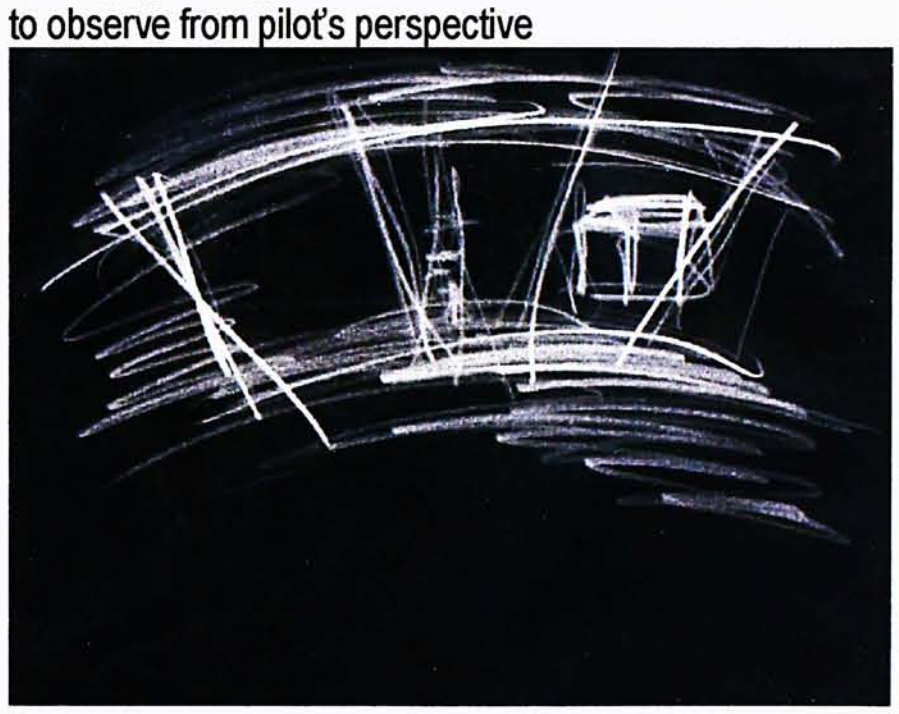


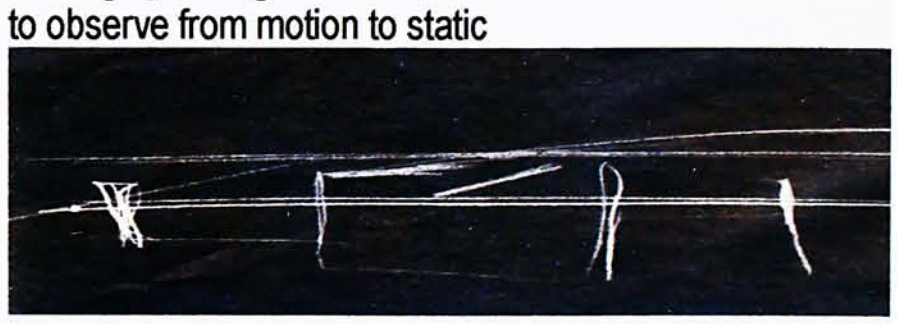
landing
to observe the contact with earth again



taxiing / parking
to observe from pilot's perspective



taxiing / parking
to observe from motion to static



01theme/concept

Architectural questions

[**motion -> space** -> sensation]

How to design a human sensation?

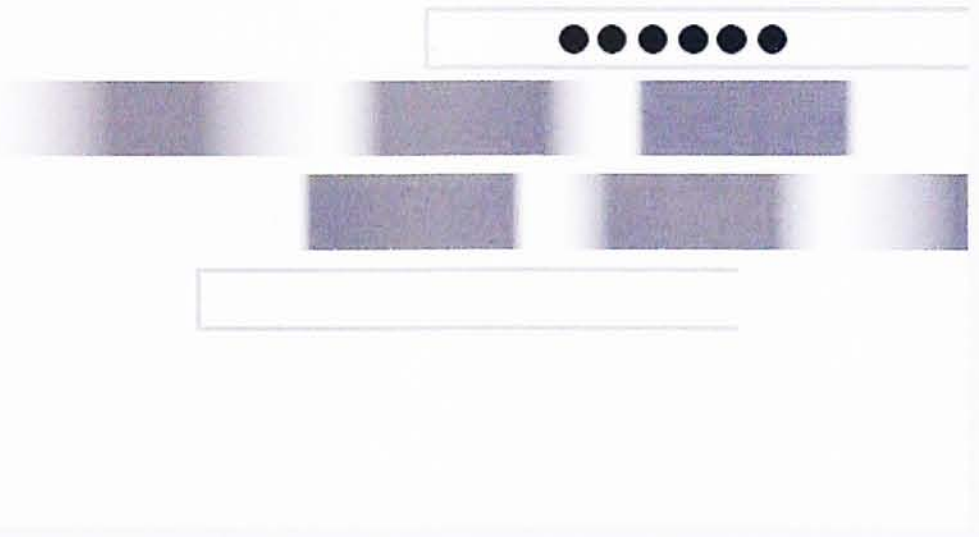
If space can generate motion, how does motion generate space?
How architecture reacts and addresses the motion?
How architecture suggests and initiates motion?
What motion be significant to spatial design?
Any similarity between natural movements (water and air movement) with pedestrian and vehicular movement and flow?
Integrate with nature, how to suggest and promote new form of flow and movement?
Could architecture itself be part of the motion process with time dimension?

[motion -> **space -> sensation**]

How architecture generates human sensation?
How architecture alters human sensation towards a motion?
How architecture simulate a sensation?

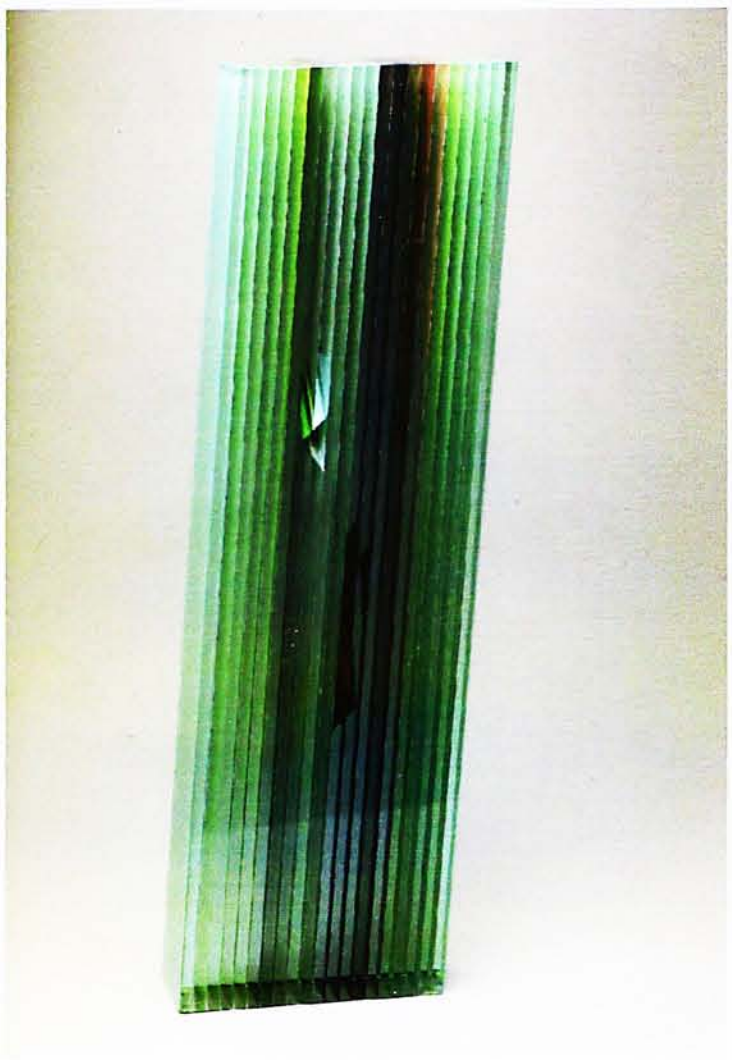
[motion -> space -> sensation / emotion]

Would emotion be generated by architectural design?



Tram station

The tram motion has already suggested the design for tram station. It is to be aligned with the motion with the parallel responding. It further predefined the human access and perceptions towards the tram motions. Passengers would naturally line up and facing the rail and wait for the next tram. The vision, hearing, smelling and touching senses are pre-defined by the motion.



[precedent study]
A passion for glass : the Aviva and Jack A. Robinson studio glass collection. Detroit, Mich. Detroit Institute of Arts, 1998.

BOHUMIL ELIAS

Penetration
1993
Plate Glass
Height 55.9cm (22 in.)
1996.98

insight

The transparency and translucency formed by glass layers contributes to a new perspective.

02

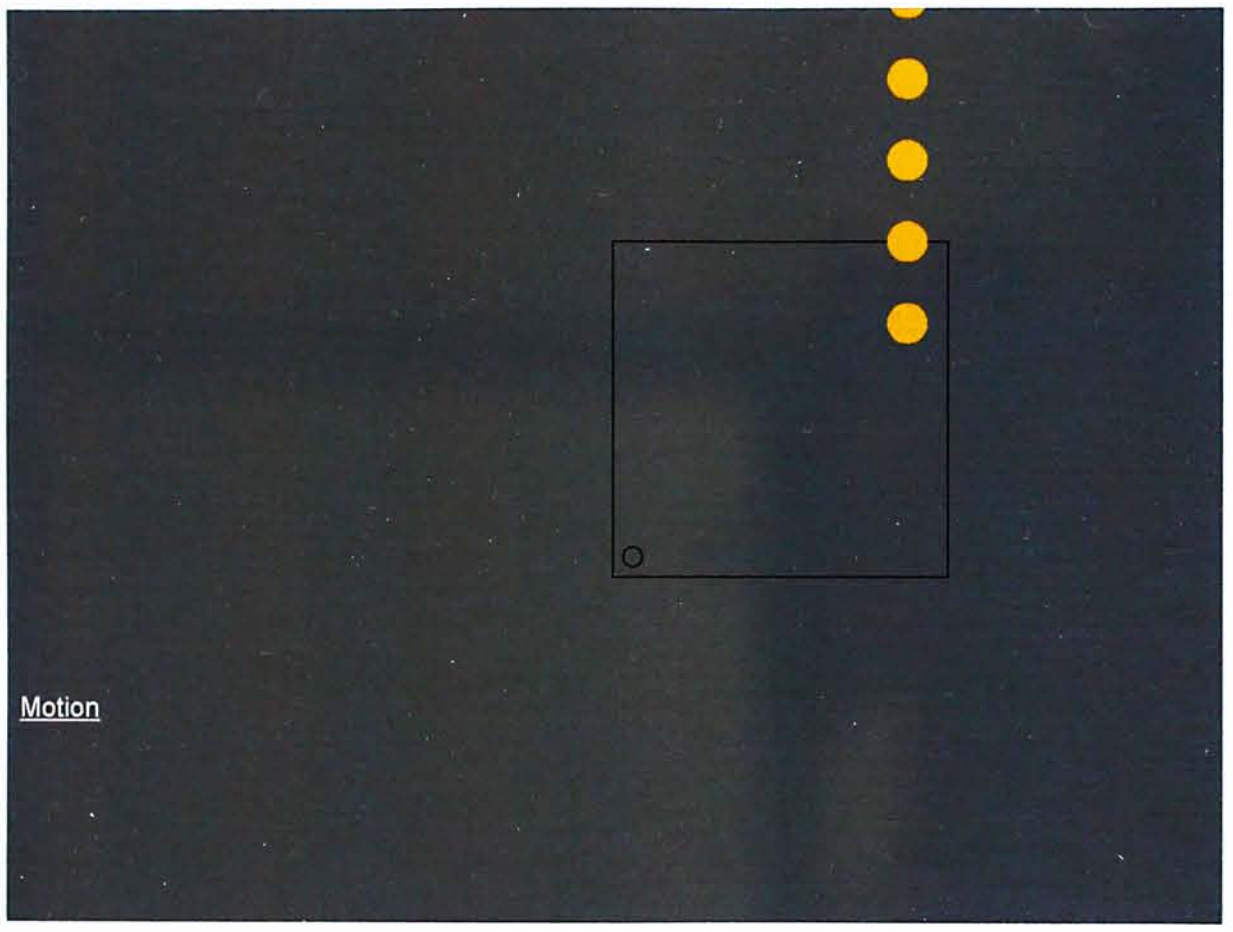
Research

- Terminology
  – Aviation / Motion / Space / Sensation
- Sek Kong Airport & Kai Tak Airport
- Flight Paths of CLK Airport
- Captive Balloons/ Flying Kites
- Interview
  - Aviation in HK
  - General aviation
  - Flying training
- Government Flight Services
- Cockpit
- Training flight Grob G115

02research

Terminology

Aviation / a·vi·a·tion
n.
1. The art or science of flying.
2. The operation of aircraft
3. The design, development, and production of aircraft
4. Military aircraft



Motion

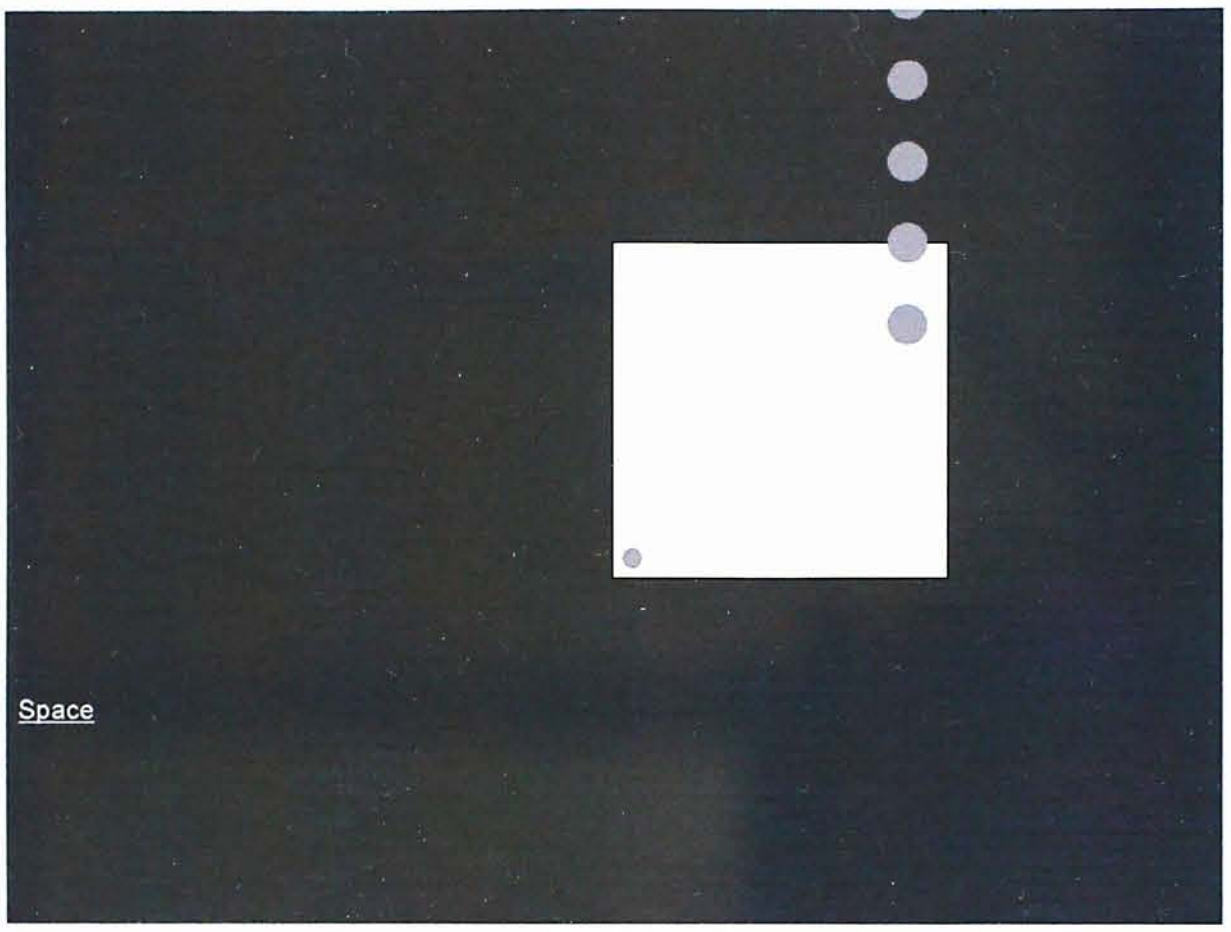
Motion is the act/process of changing position/place. The motion of human being/object (e.g. automobile, ship and aircraft) would suggest the space design. On the other hand, the space definition would generate motion of human being/object. Moreover, the space would be changed by motion occurring in time dimension.
Thus, the change is a process with time dimension. As the motion itself could be perceived as relative regarding the observer, it is defined relatively.

3-dimension movement vs. time-dimension movement

relative movement / static vs. dynamic

Precedent study on topic movement and architecture

02research



Space

Terminology

Space

Architecture is the interface for human to experience the motions. It advocates and proposes a perspective to experience the motion and thus alter the sensation aroused. The volatility of motion alters the space definition. And the change in space design would arise diverse perceptions.

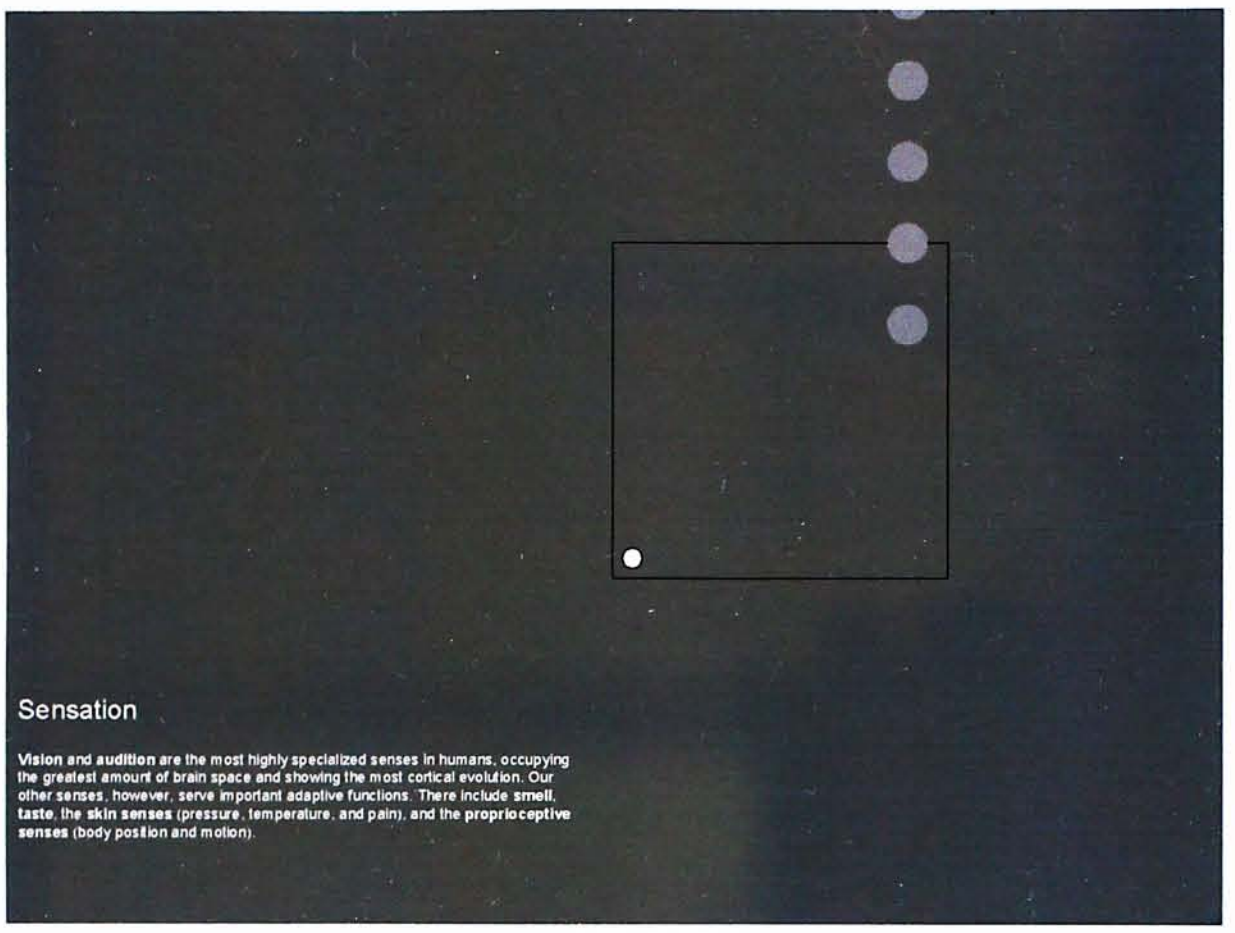
Implement Motion as a design genius to design a space offering experience with arising and motivational properties._

Flying an aircraft requires an on-time reaction by sensing the variation in motion. Pilots are trained to be concentrated and be sensitive towards motions. However, Aircrew members are human, they would lack in adequate attention and concentration out of working times. They like to have a good time and don't take themselves too seriously. *(Aerospace Clinical Psychology, p.52)*.

Also, they would have usual psychological anxiety, like de-motivation and fear. Thus, variety in space design could initiate their positive learning altitude.

tectonic approach
scale, component, inter-relationship of spaces

02research



Terminology

Sensation

Sensation is the process by which the sense organs gather information about the environment. Human experiences the space with their perception by interpreting these sensations[1]. Thus, space is not merely defined by visual component of all senses[2].
Life of an architecture possesses change, the sensation initiated by the building would believed to be altered.

Tasting
The word sapiens is said to be derived from the word *sapor* for just as the sense of taste is able to discern the flavors of different foods, so too is the wise able to discern objects and their causes since he recognizes each one as distinct and is able to judge them with an instinct for truth.

Isidor of Seville

Smelling
Smell of nature, smell of water, Ventilation / isolation
Hearing
> A measure of silence / contrast
Seeing
Seeing and be seen / Visible and invisible
Light and color
Touching
touchable and not touchable

Flying experience vs. sensations
design genesis is the motion of flight and the space provided to stimulate the sensation of pilot

[1] Proprioceptive senses, register body position and movement, Kinesthesia provides information about the movement and position of the limbs and other parts of the body relative to each others. Vestibular sense provides information on the position of the body in space by sensing gravity and movement.

[2] Vision (light/color), Hearing(pitch/loudness), Smell, Taste, Touch(pressure/tempurature/pain)

Sek Kong Airport

Sek Kong Airport is situated in northwestern New Territories. People's Liberation Army Air Force, Government Flying Service (GFS), fixed-wing aircrafts and helicopters now use the airport. It is not suitable for airlines. Since Kai Tak Airport HKG becomes more and more crowded and busy, most of the private fixed-wing aircrafts uses Sek Kong Airport.

Operation Hours	Daily daylight for authorised users, daily night for military and GFS aircrafts only
Reference Point	2226.50N 11405.00E
Elevation	50ft
Runway No.	RWY11, RWY29
Runway Dimensions	1263m X 34m

Kai Tak Airport

In 1924, local businessman Sir Ho Kai and Mr Au Tak started to reclaim land in Kowloon Bay for a speculative housing development. The reclaimation was completed, but the venture failed. The land reverted to Hongkong Governent just at the time when thought was being given to an aircraft landing field and flying boat moorage. On Lunar New Year's Day 1925, the first aircraft was to take off from the grass strip. The civil airport at Kai tak was a reality. By 1927, an RAF detachment was housed there in matshed hangars. In 1928, a crane and slipway to handle flying boats were built, and in 1930 the first civillian airport superintendent, Mr A.J.R.Moss was appointed.

In 1935, the first control tower and fire engine were in place. The first commercial passenger, Mr Ong Eee-Lim, arrived on 24th March, 1936 on a mail flight from Penang and in 1937 the airport handle all of 3685 passengers.

The first tarmac runway, 457 metres long, running east-west was completed in 1939. During the Japanese occupation, a north-south runway 1371 metres long was added and the earlier runway extended to the same length.

Commercial flight to Kai Tak resumed in September 1945. Within a few years, it was clear that major expansion of the airport was needed. In 1954, work began on a new terminal; while in 1956, a contract was let to reclaim sixty hectares of land in the bay to build a new 2194 metres long north-south runway. By 1965, Kai Tak was handling nearly 1 million passengers a year. In 1970s, the new runway was extended to 2541 m, and later in 1975 to 3358m, so as to handle the new large jets like the Boeing 747 and Mcdonnell Douglas DC-10. The aircraft parking area was extended as well from a capacity of ten planes to thirty-three. In 1976, over 4 million passengers passed through the airport and the first cargo terminal opened.

During its sixtieth anniversary year in 1987, Kai Tak handled over 10 million passengers and half a million tonnes of cargo. In 1995, this had grown to over 24 million passengers and nearly one and a half million tonnes cargo.

Flight Paths of CLK Airport

Design

1. The flight paths for the new Hong Kong International Airport (HKIA) were developed through careful studies. In accordance with international standards and recommendations, their development took into account runway alignment, terrain environment and obstacle clearances, location of navigation aids, aircraft operating criteria, environmental consideration, airspace coordination with nearby airports, etc. Hong Kong is small in size and hilly in topography. It is not possible to design flight paths that are in compliance with international aviation safety requirements on the one hand and completely clear of all residential developments on the other. When Civil Aviation Department appointed international aviation experts to assist in the planning of the flight paths for the new airport in 1994, various factors had been taken into account, and in-depth studies were conducted before the current flight procedures were published for use.

Arrivals

2. The HKIA has 2 parallel runways (commonly called the North Runway and the South Runway) which run northeast to southwest. At present, the two runways are normally operated in a segregated mode, i.e. the South Runway dedicated for departures and the North Runway for arrivals (with the exception of cargo flights and the Government Flying Service's aircraft which for operational reasons will normally use the South Runway for landing). However, there are circumstances where the airport may be operated with a single runway, for example, in the event of runway blockage or during scheduled maintenance periods at night. In the long run, aircraft landing and departing simultaneously on both runways will be considered as air traffic demand increases.
3. The direction from which aircraft land at HKIA mainly depends upon the wind direction. For safety and operational reasons, aircraft generally land into the wind. When the wind is from the west or southwest (which is prevailing in summer), aircraft will approach HKIA from the northeast overflying Tseung Kwan O, Sai Kung, Ma On Shan, Shatin and Tsuen Wan (including Sham Tseng and Tsing Lung Tau). When the wind is from the east or northeast (which is prevailing in winter), aircraft will approach HKIA from the southwest (over water).
4. The map in Appendix A shows the arrival flight paths to HKIA.

Departures

5. The direction in which aircraft depart from HKIA also depends upon the wind direction. For operational reasons, aircraft generally take off into the wind. When the wind is from the west or southwest, aircraft will depart from HKIA initially towards the southwest until it is about 7 nautical miles from the runway where it will make a left turn. Depending on its destination, an aircraft may turn towards the east and pass over Hong Kong Island and Kowloon Peninsula, or turn towards a northerly direction, passing over the New Territories at a relatively high altitude.
6. When the wind is from the east or northeast, aircraft will depart from HKIA towards the northeast until it reaches Ma Wan where, depending on flight destinations, it may turn south over West Lamma Channel, or proceed to the southeast passing over Tsing Yi, the southern part of Kowloon Peninsula (such as Tsim Sha Tsui and Hung Hom) and the northern part of Hong Kong Island (such as North Point, Shaukeiwan and Chai Wan). Aircraft destined for mainland may overfly the New Territories but would be at a relatively high altitude.
7. The map in Appendix B shows the Standard Instrument Departure (SID) tracks followed by departing aircraft from the South Runway of HKIA. SIDs are a set of standard procedures which pilots are required to follow in the absence of being given alternative instructions by an air traffic controller (ATC). Their primary purpose is to enable the efficient transition of departing aircraft from the airport to the upper level airways. Pilots are required to follow these routes unless instructed otherwise by ATC. For the efficient management of limited airspace, ATC may give pilots a more direct route to their destination or a radar heading for separation with other traffic.
8. It should be noted that an aircraft in flight cannot follow a track precisely like a train running along a railway track. There are many factors that may affect the aircraft's flown track - the wind speed and direction relative to the aircraft's intended flight path, the performance characteristics of the aircraft, tolerances in navigational aids and different piloting skills and techniques etc. In practice, the flown tracks may deviate either side of the nominal centre line shown in the map in Appendix B. Past studies have shown that the majority of aircraft follow the assigned routes within 1.5 km either side of the nominal centre line.

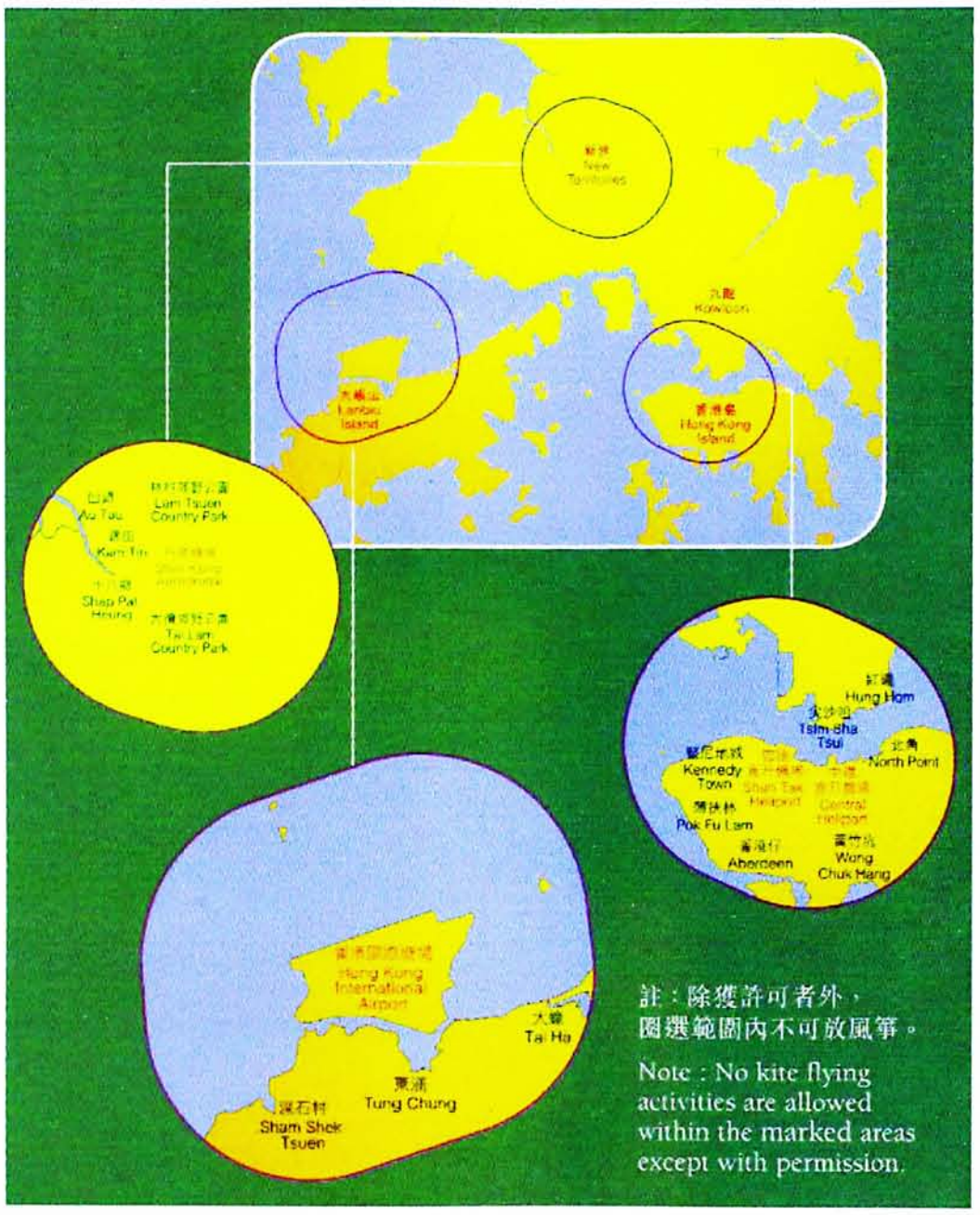
Appendix A

Appendix B

flying

02research

Captive Balloons/ Flying Kites



A new airport would affect the airspace of adjacent district and thus further affect those recreational activities.

"Hot" Spots for Flying Kites

- Shek O
- Tai Au Mun
- Wu Kai Sha
- Shap Sze Heung
- Tai Mei Tuk

02research

Pilot training

1. How to be a pilot in Hong Kong?
2. How is the career path of a local pilot?
3. Formal training vs. fun ride?
4. How to train a pilot? (program)
5. Daily life of an cadet pilot?
6. How large is the aircraft for training? (space requirement)
7. Facilities and training program? (program)
8. Geographical / climatic requirement for flight training? (site)
9. Private pilot?
10. Why HK don't have a flying school?
11. How about in Singapore?
12. What if an accident in flying school?
13. What is the minimal facility required?

Course

1. Engine (hand-on in hangar)
2. Meteorology (observe sky and weather)
3. Aerodynamic (hand-on in hangar)
4. Human factor
5. Air law (hand-on in hangar)
6. Electronic

Interview

Aviation in HK

1. Kai Tak / CLK / Shek Kong
   (access, opening hour, scale, support)
2. Flight path, air traffic and air space of HK
3. What is general aviation?
4. Organization or association?
   Air Cadet / Aviation Club

Air Cadet

1. Channel for young generation to know about aviation (issue)
2. Aim and target group?
3. Existing limitation? (issue)
4. Existing program and facilities? (program)
5. What is the minimal facility required?
6. Financial sources?
7. Future development?

Existing states

1. Read local flying chart of HK
2. CLK and Shek Kong airport

02research

Purpose for the information
Generating program

Site component

Site availability

Issue

User group

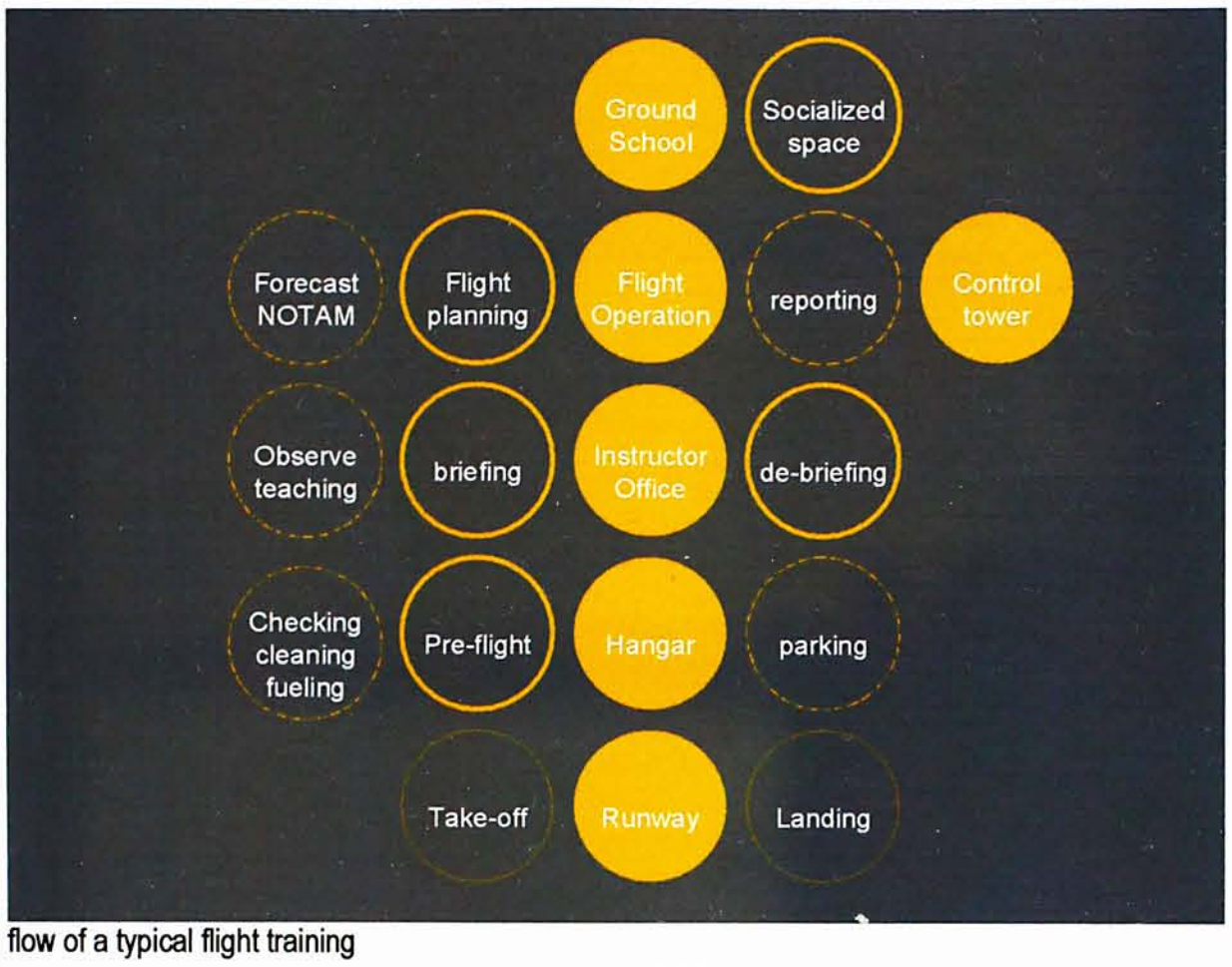
Interview

General Aviation

The mass of private, flying-club, executive, agricultural, survey, and rotary-wing aircraft that are given the collective title 'general aviation'.
*background information

1. what is a flying ground?
Flying school = ground sch + flying sch + airport
where HK pilot be trained?
Flight training in *Adelaide Australia*
why HK don't have flying schools?
colonial government, without military school
how Singapore training pilot?
profit making or government owned?
function except pilot training?
general airport, education, storage and tech.support
2. Airports in HK: CLK / SK / Central (helicopter)
3. Flight path and air traffic at HK
4. General aviation
How was the usage as general aviation of local airports?
Kai Tak used to provide services for GA before the peak hour daily
5. Involved parties
Govt civil aviation department
Govt airport authority hk
Govt flying service
HK Air Cadet corp
Corporation CX, DA, CA
Private pilots

02research



flow of a typical flight training

Interview

Flying training
Preparation (flight plan, map, flight ops)

1hr pre-flight
1-3hr flying
0.5-1hr de-briefing

(total 200 hr in 400 days training)

Monday – Friday (ground school)
7.30 breakfast

8.00 **lesson**
9
10
11

12.00 lunch

13.00 **lesson**
14
15

16.30 free time
17
18.00 dinner

19.00 **study**/gym
20
21
22

23.00 sleep

Public participantion
1. rental for public
2. hangar storage
3. courses offered
4. observation

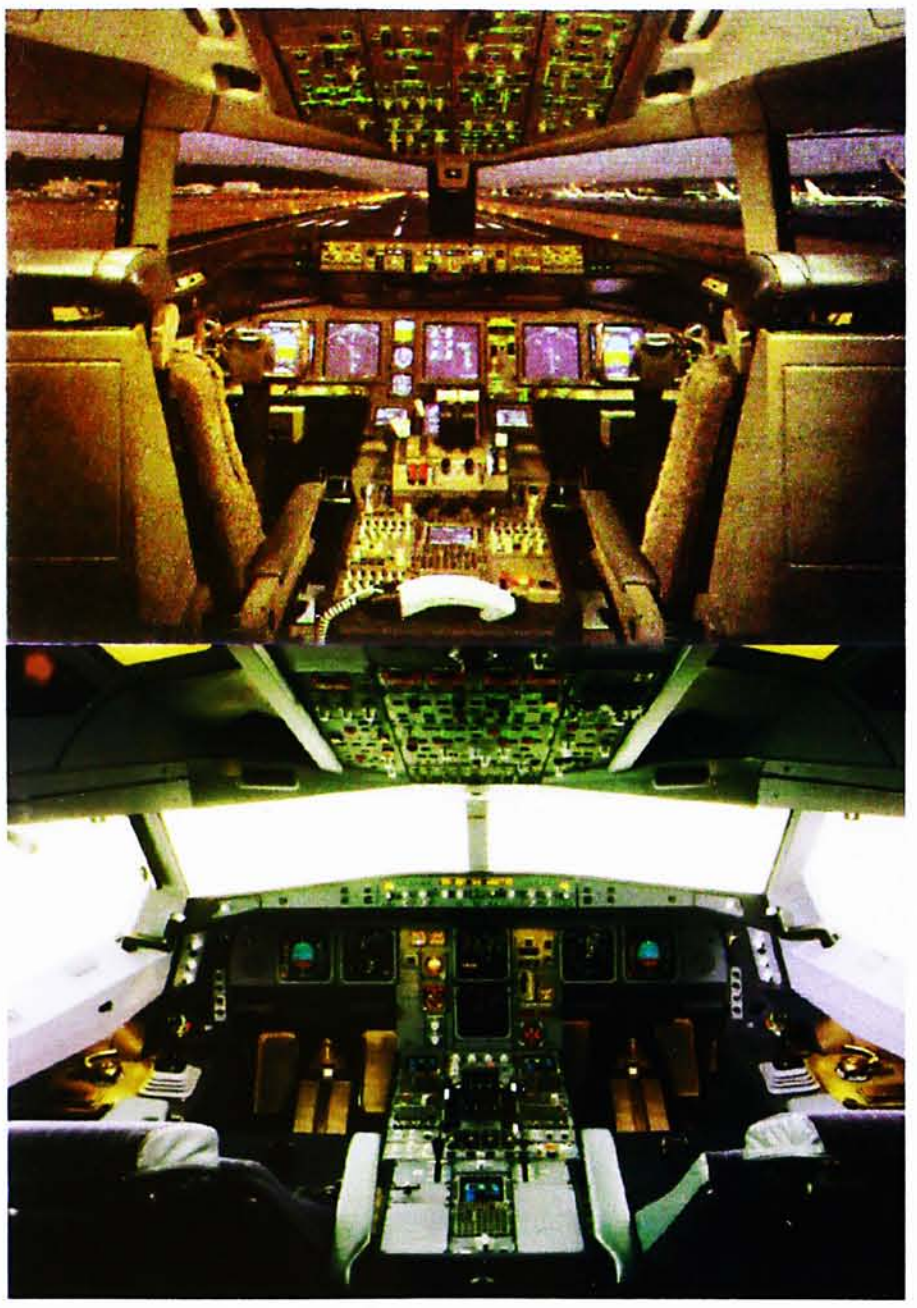
02research

Government Flight Services

A department of the Government of the Hong Kong Special Administrative Region employing 235 civil servants responsible for flight operations, maintenance and administration.
The GFS is located at the south-western corner of the Hong Kong International Airport after moving from Kai Tak in June 1998.
The GFS began its operation in 1949 as the air arm of the Hong Kong Defence Force from which it separated in 1970, becoming the Royal Hong Kong Auxiliary Air Force. As the unit's responsibilities expanded, it became a member of the Disciplined Services on 1 April 1993 with the title of Government Flying Service.
http://www.info.gov.hk/gfs/

02research

Cockpit



The Boeing 777 flight deck

The A340 Cockpit shares maximum commonality with the other members of the new generation Airbus Industrie product line.

* Why is a cockpit called a cockpit?
The original sense of this term is a pit for fighting cocks, but was also used by Shakespeare in Henry V to refer to a performance or the theatre itself. The nautical sense of the word refers to the sleeping quarters below deck, either because the junior officers lorded over the sailors like roosters, or because of its resemblance to a chicken coup. Since most of the first pilots were military men, the term was transferred to plane talk.
(p.054 WALLPAPER* november2001)

02research

Training flight

Grob G 115

A training flight used in BAE Flight Training, Adelaide

<u>Dimensions</u>	
Wing span	32ft.9in.
Wing area	131.43sq.ft.
Length	24ft.2in.
Height	9ft.
<u>Weights & loadings</u>	
Max take-off	1874lbs
Equipped empty	1250lbs
Useful load	624lbs
Max fuel	22 imp galls
Max baggage	44lbs
<u>Performance</u>	
Max speed at sea level (rpm limited)	110kts
Take-off distance over 50feet	1345ft
Landing distance over 50feet	1460

03

Design / **Site**

- Site consideration
- Hong Kong Local Flying Chart
- Site options
- Site options comparison
- Site context

03site

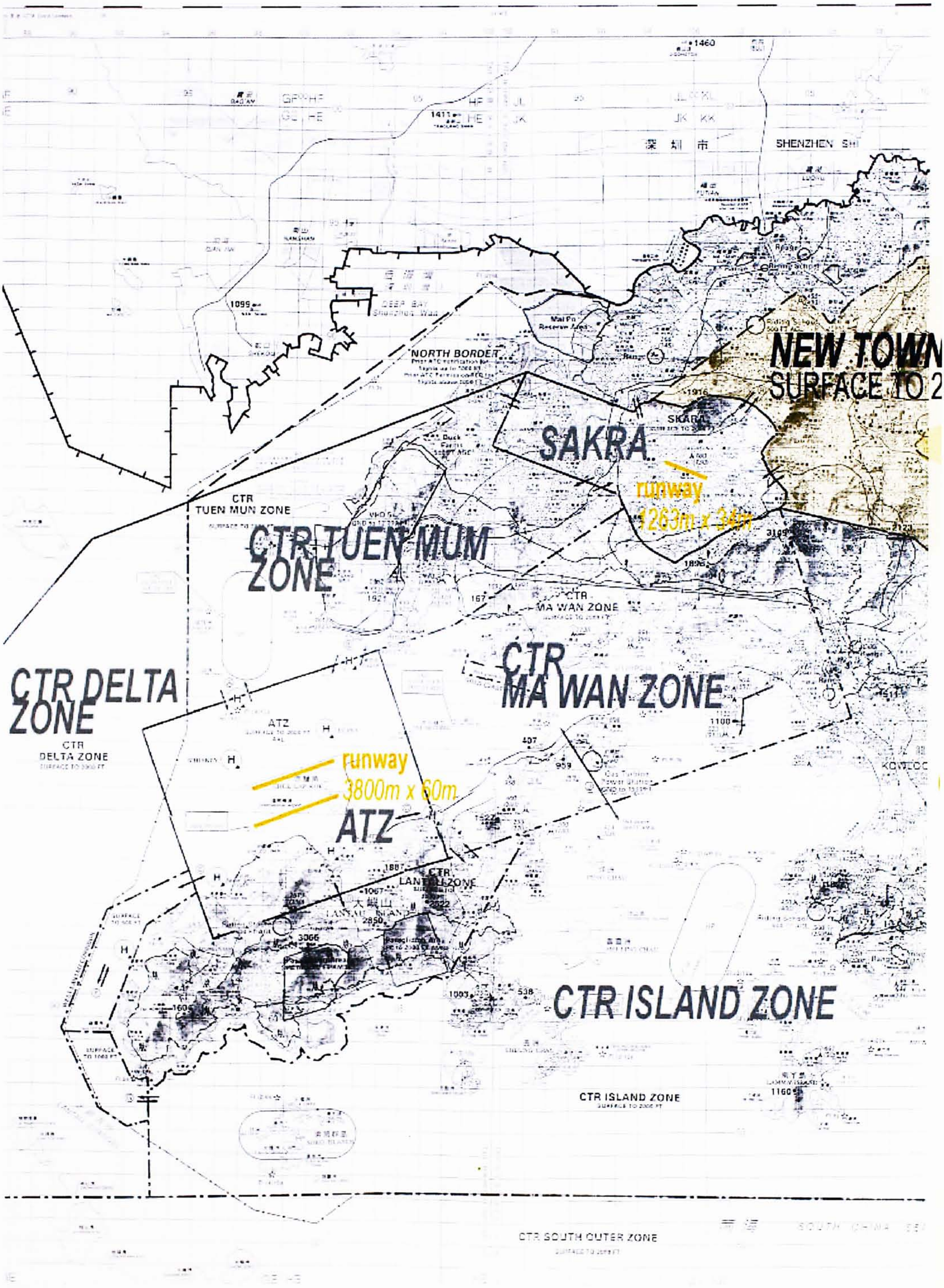
Consideration

1. **ATC (Air Traffic Control)**
   air space available
2. **Terrain / Gradient**
3. **Length and direction of runway**
   for circuit training
4. **Local transportation**
5. **Climate**
   wind/direction of speed, visibility, cloud
6. **Impact on environment**
   Noise abatement
7. Possibility of Forced landing
8. Possibility of navigation training

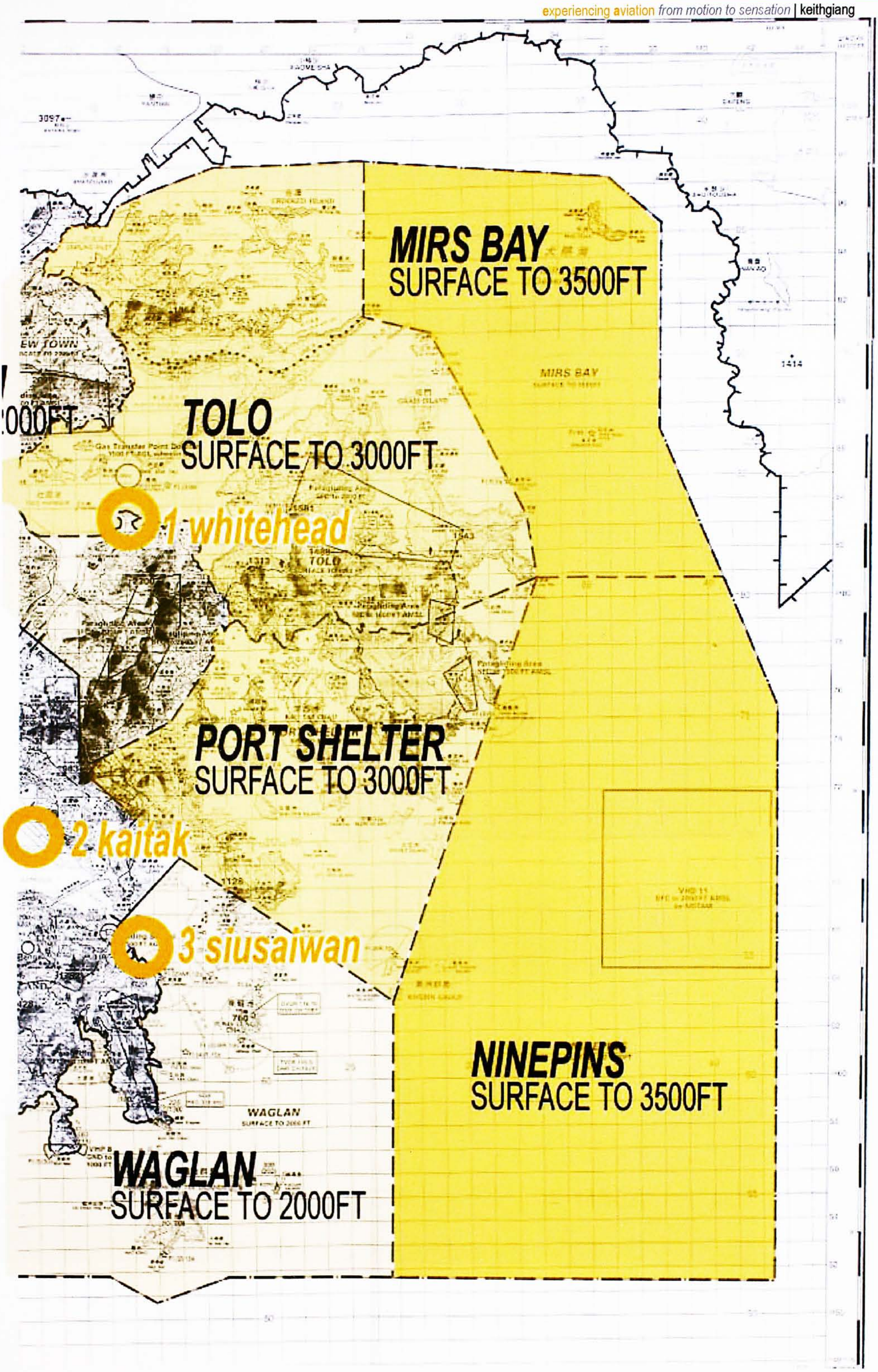
Virgin site or attached in existing airports?

noise abatement consideration

1. take-off / landing
2. flying route
3. berm
4. operating hours



Airspace of west half of HK has been occupied by 2 existing airports.


MIRS BAY
SURFACE TO 3500FT
TOLO
SURFACE TO 3000FT
1 whitehead
PORT SHELTER
SURFACE TO 3000FT
2 kaitak
3 siusaiwan
NINEPINS
SURFACE TO 3500FT
WAGLAN
SURFACE TO 2000FT

3 site options located on east half of HK.

03site

options

1. Whitehead
2. Kaitak
3. Siusaiwan

1.

2.

3.

03site

Site options comparison

	Whitehead	Siusaiwan	Kaitak
Air Traffic Control	+++	++	+
Terrain / gradient	+++	+	+
Climate	++	++	+
Runway	+++	++	++
Local transportation support	++	++	+++
Noise Abatement	++	+	+++
Navigation	-	-	-
Possible for forced landing	+	-	-

WHITEHEAD, maonshan

Considering the local flying chart of Hong Kong, huge "uncontrolled zone" from surface to about 3500ft located at east Hong Kong is good for general aviation and could be considered as possible site. Airspace of west half of HK is basically occupied by CLK and SK, 3 sites were picked in east half of HK based on accessibility as the need to be reached by general public. Comparatively, Whitehead is the optimum site by considering terrain, safe, air traffic control, noise abatement, navigation and local transportation. Navigation (cross-country training) may not be provided in Hong Kong.

hearing

03site

Site context
WHITEHEAD,
maonshan

maonshan town

tolo harbour

natural woodland

existing golf course

natural woodland

starfish bay

future lee on station, ma on shan railway

04

Design / **Program**

- Issues
- Program
- Design brief
- Programming consideration

Issue

1

to promote aviation culture for general public of Hong Kong

2

to provide general aviation facilities to cope with the current demand

3

to offer local formal flight training program for young generation

04program

Issues

Why train local pilot?

- current training program
- In line with the promotion of tourism and aviation business and attempts to reduce the traditional reliance on expatriate fliers, Cathay was committed to boosting local pilot numbers. Moreover, after closing of Kai Tat Airport, support for General Aviation[3] is extremely inadequate. To design a flying school in Hong Kong is valuable to pilot training for new generation and to promote aviation culture to general public.

Why promote aviation culture?

- needs by young generation or general public
- to expand the base for potential pilot through earlier aviation education

Why provide general aviation?

- Kai Tak used to provide services for GA before the peak hour daily
- Current support for general aviation is very limited by Sekkong airport.

3 Type of aviation: commercial(airline), Military, General. General Aviation includes flying training, joy flight (private flying, scenic flight), other private purposes. Shek Kong is technically a military airport. It only supports General Aviation during weekends and holidays. And, CLK is not open to General Aviation.

DGCA Congratulates Cadet Pilot Graduates in Australia [Information Services Department, HKSAR Government]

Mr Albert Lam, Director-General of Civil Aviation today (August 24) attended the graduation ceremony of the first batch of cadet pilots who have successfully completed a training programme run by a Hong Kong Civil Aviation Department (CAD) approved flying school in Adelaide, Australia.

The school named BAE Systems Flight Training (Australia) Pty. Ltd. is the first overseas flying training organisation granted with the CAD approval to conduct professional pilot training courses of an approved syllabus which will enable the pilot trainees, upon course completion, to satisfy CAD's licensing requirements for the direct issue of a Hong Kong Commercial Pilot Licence with an Instrument Rating (HK CPL/IR). The approval covers a period of two years.

The 10 cadet pilots who graduated today are all Hong Kong young people selected by Cathay Pacific Airways (CPA) to join its Cadet Pilot Programme. Mr Lam wished them every success in their future endeavours.

"In order to facilitate Hong Kong airlines' efforts to increase the annual output of cadet pilots by conducting more training courses, CAD put in the necessary manpower and resources to introduce the CAD 509 approval scheme in early 2000. It is a scheme under which a suitably qualified flying training organisation, in or outside Hong Kong, may be approved by CAD to conduct ab-initio commercial pilot training courses for the direct issue of a HK CPL/IR.

"BAE Systems, already well known in aviation industry as an elite pilot training provider, approached us in 2000 for an approval. After screening all the necessary technical documents and conducting a series of on-site inspections and audits on BAE's facilities, aircraft and instructors at Adelaide, CAD was satisfied with the highly professional standards of the training staff and the well-run facilities at BAE. A well-structured training curriculum was tailored for a HK CPL course.

"In June 2000, BAE became the first flying training organisation in the world to be granted with the CAD 509 approval. Subject to regular audits, CAD will continue to approve BAE as a suitable CPL training institute," Mr Lam said at the graduation ceremony.

Prior to the grant of the CAD 509 approval to BAE Systems, all CPA and Dragonair cadet courses were based on an Australian Commercial Pilot Licence syllabus. After achieving the Australian Commercial Pilot Licence, the cadets would need to undergo further flight and theory training with BAE Systems in order to pass the Hong Kong flight tests and ground examinations for the purpose of converting their Australian licence into HK CPL/IR.

The licensing requirements are streamlined as a result of the elimination of the licence conversion process. The courses could be conducted in a more cost effective and timely manner. Cadets would benefit from a better structured curriculum because they do not need to spend extra time and effort to cope with additional flight tests and ground examinations.

Before attending the CPA cadet pilots graduation ceremony in Adelaide, Mr Lam also visited the General Flying Services (GFS) in Melbourne yesterday (August 23), and discussed with the GFS representatives on various issues pertaining to the training of CAD officers. GFS currently provides light aircraft flying training to CAD officers, including Student Air Traffic Control Officers up to Private Pilot Licence (PPL) standard. Such training would widen the student controllers' general aviation knowledge, enhance their alertness, anticipation and decision making in handling difficult or emergency situations.

Mr Lam will return to Hong Kong tomorrow (August 25).

Cathay seeks to double recruitment of local pilots

[By Glen Norris in Adelaide Hong Kong iMail]

CATHAY Pacific (0293) plans to more than double the number of Hong Kong residents graduating from its Australian pilot training college as the airline attempts to reduce its traditional reliance on expatriate fliers.

Cathay's cadet pilot intake at BAE Systems Flight Training Centre in Adelaide, South Australia, will rise to 48 this year from 26 last year.

Cathay Pacific director of personnel William Chau Siu-cheung told iBusiness that pilot intake next year would be "more than 48" but declined to specify a figure.

Mr Chau added that Cathay had not set a quota for the number of local pilots it wanted in its ranks, but conceded that locating suitable talent was a challenge. Currently, 90 per cent of Cathay's 1,400 pilots are recruited overseas.

He said one of the difficulties in recruiting locals was that Hong Kong did not have an airforce _ a traditional talent hunting ground for airlines.

But Cathay was committed to boosting local pilot numbers and not just because they were cheaper to employ than the expatriates who are currently leading a damaging industrial action against the airline.

"We have to show the community that we are committed to helping Hong Kong," Mr Chau said. "We are going to secondary schools and trying to attract young people to aviation."

Cathay's cadet pilot programme is only open to permanent Hong Kong residents and preference is given to those born in the SAR.

Launched in 1988 and originally based in Scotland, the programme has trained more than 137 cadets who are currently working as pilots for Cathay. Early graduates of the course are now senior first officers with some expected to be promoted to command rank within the next few years.

The 60-week programme was transferred to the BAE training centre at Parafield near Adelaide in 1994. BAE also has contracts to train pilots from Dragonair, China Airlines and the Hong Kong Government Flying Service.

After graduating with a commercial pilot licence, trainees are given an additional four months' training by Cathay before going into line service as second officers on the B747 or A340 fleets. It costs Cathay approximately $1 million to train each cadet, including the cost of the course, accommodation, meals, weekly allowances and other expenses.

Prior to 1999, Cathay trained an average of only 12 cadets each year but that was increased to 23 in 1999.

The licensing system has recently been streamlined with cadets now issued with a Hong Kong commercial pilot licence directly after graduation. Previously, graduates were given an Australian licence which had to be converted into a Hong Kong licence after further testing.

BAE Systems is the first overseas flying school granted approval from the Hong Kong Civil Aviation Department (CAD) to issue the new licences. The first group of 10 cadet pilots under the new programme graduated on Friday.

CAD director general Albert Lam Kwong-yu said the new system would help shorten approval times and ensure training was more suited to local conditions. "The CAD has put in the necessary manpower and resources to introduce the approval scheme," Mr Lam said. "After screening of all the necessary technical documents and conducting a series of on-site inspections and audits on BAE's facilities, aircraft and instructors, we were satisfied with the highly professional standards of the training staff."

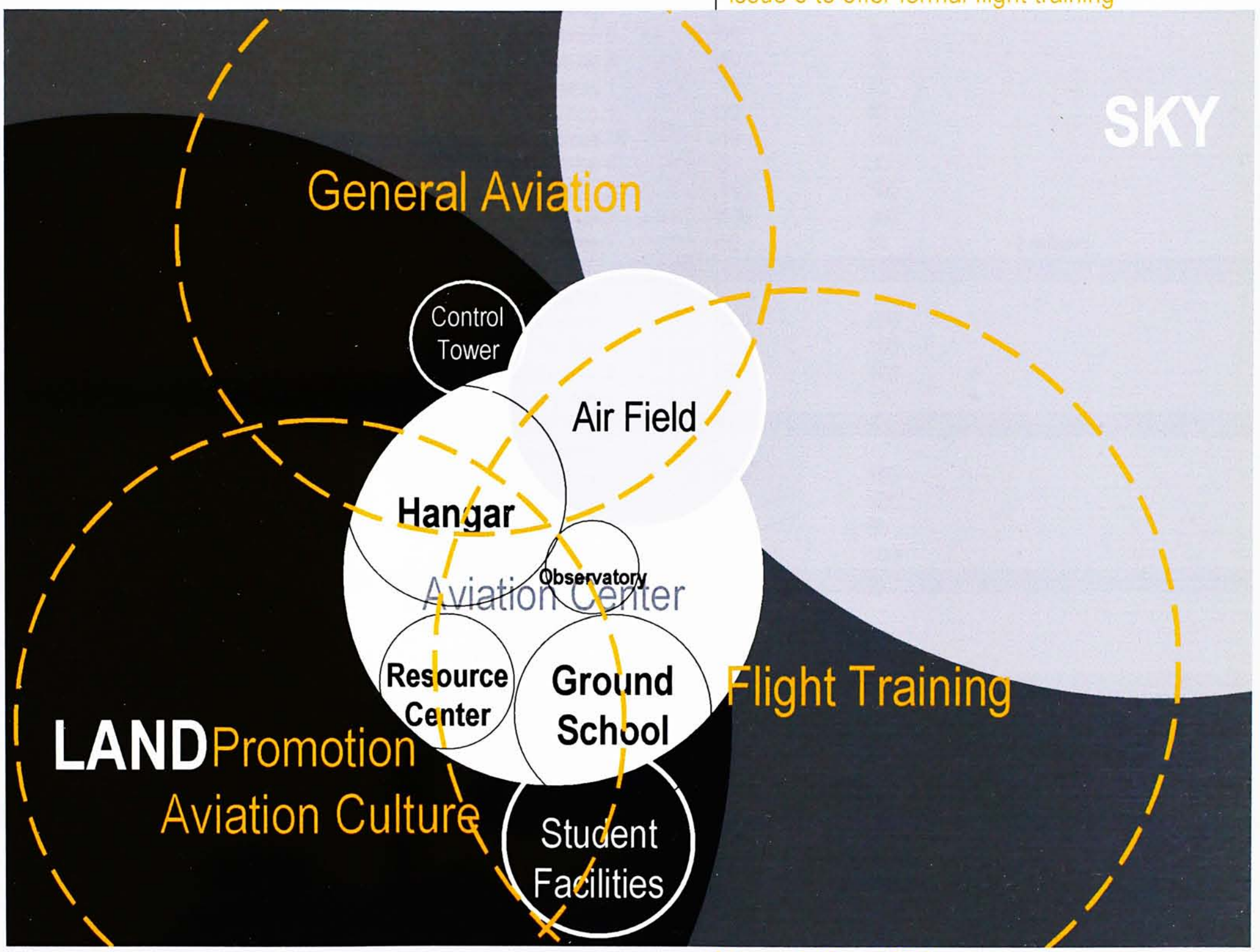
Mr Lam added that commercial pilot training could now be conducted in a more cost-effective manner.

He welcomed Cathay's commitment to boost the number of local pilots, revealing that he had an ambition to become an airline pilot himself in the 1960s but did not have the opportunities that exist now.

04program

Program

issue 1 to promote aviation culture
issue 2 to provide general aviation
issue 3 to offer formal flight training



Inter-relation of 3 issues

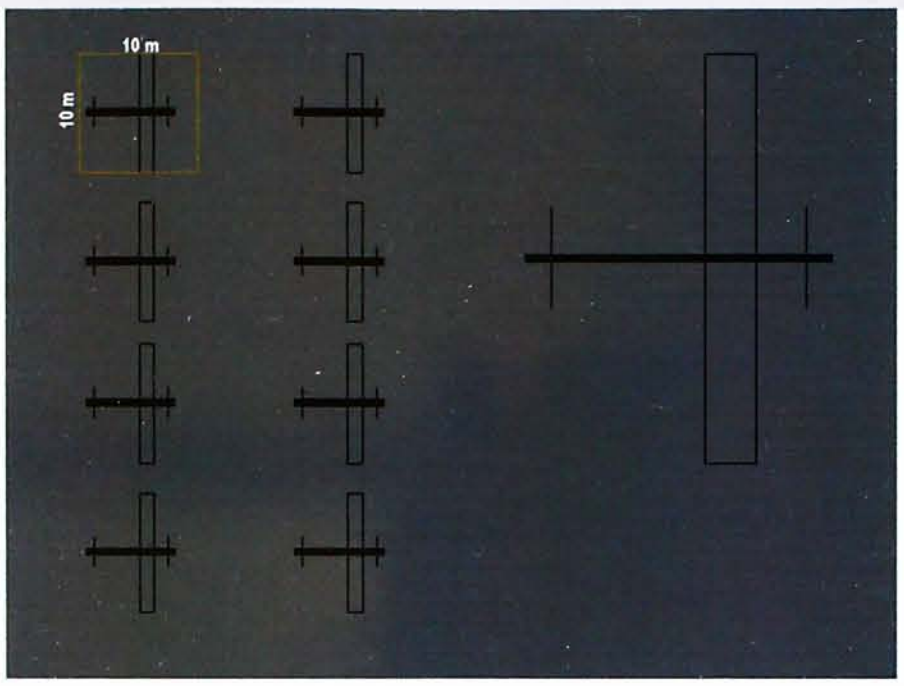
* aviation center
= **hangar + flying school + observatory + resource center**
flying school = ground school + flight training school + airport

04program

Design brief

Assume
100 students (8 classes)
15 instructors
20 training aircrafts

	Number	Area (sq.m)	sum	Note
Teaching				
Classroom	6	60	360	
Classroom (small)	3	30	90	
Flight operation	1	75	75	
Flight planning workshop	4	20	80	
Instructor offices	15	10	150	
Briefing/debriefing room	6	5	30	
Meeting room	2	150	300	
Hall	1	300	300	
Administration office	1	50	50	8 officers
			1435	
Social area				
Entrance Lobby	1	200	200	
Bar	1	100	100	
Game room	2	50	100	
Gathering place	2	50	100	
			500	
Resource center				
Library	1	150	150	
Computer room	1	100	100	
TV room	2	25	50	
Display room	1	100	100	
			400	
Public				
Air cadet office	2	100		
Observatory level	?			
Services				
Pantry	4	10	40	
Toilet	4	20	80	
Changing room	4	20	80	
			200	
Circulation	?	20%		
E/M reserved	?	10%		
Parking		450	450	
Students				
Canteen	1	150	150	
Kitchen	1	45	45	30% upon canteen
Gym	1	100	100	
Laundry	1	30	30	
Game room	3	100	300	
Sport field	?			
Hostel*	1	1500	1500	100 students (@15sq.m)
			2125	
Airfield*				
Hangar	1	5000		
Fuel storage	?			
Parking area(indoor/outdoor)	1	5000	20 x 120 x 2	
Runway	1		About 1000m length	
Taxiway				
Control tower				



Reference

Training flight **Grob G 115** / Dimensions
Wing span 32ft 9in (10m)
Length 24ft 2in (7.3m)
Height 9ft (2.7m)

Boeing Business JET / Length 33.63m Wingspan 35.79m
Boeing 777-300 / length 73.9m

04program

Programming consideration

1. Balance general aviation and flight training
2. How many facilities could be shared by public?
3. How an aircraft be "shipped"?
4. Is hangar really needed in this case?

Requirement
Public access and participation
1-1 training / group learning
Briefing (observation. Wind direction, weather)
Debriefing (privacy)
Classroom (hands on)

New dimension to sense the motion

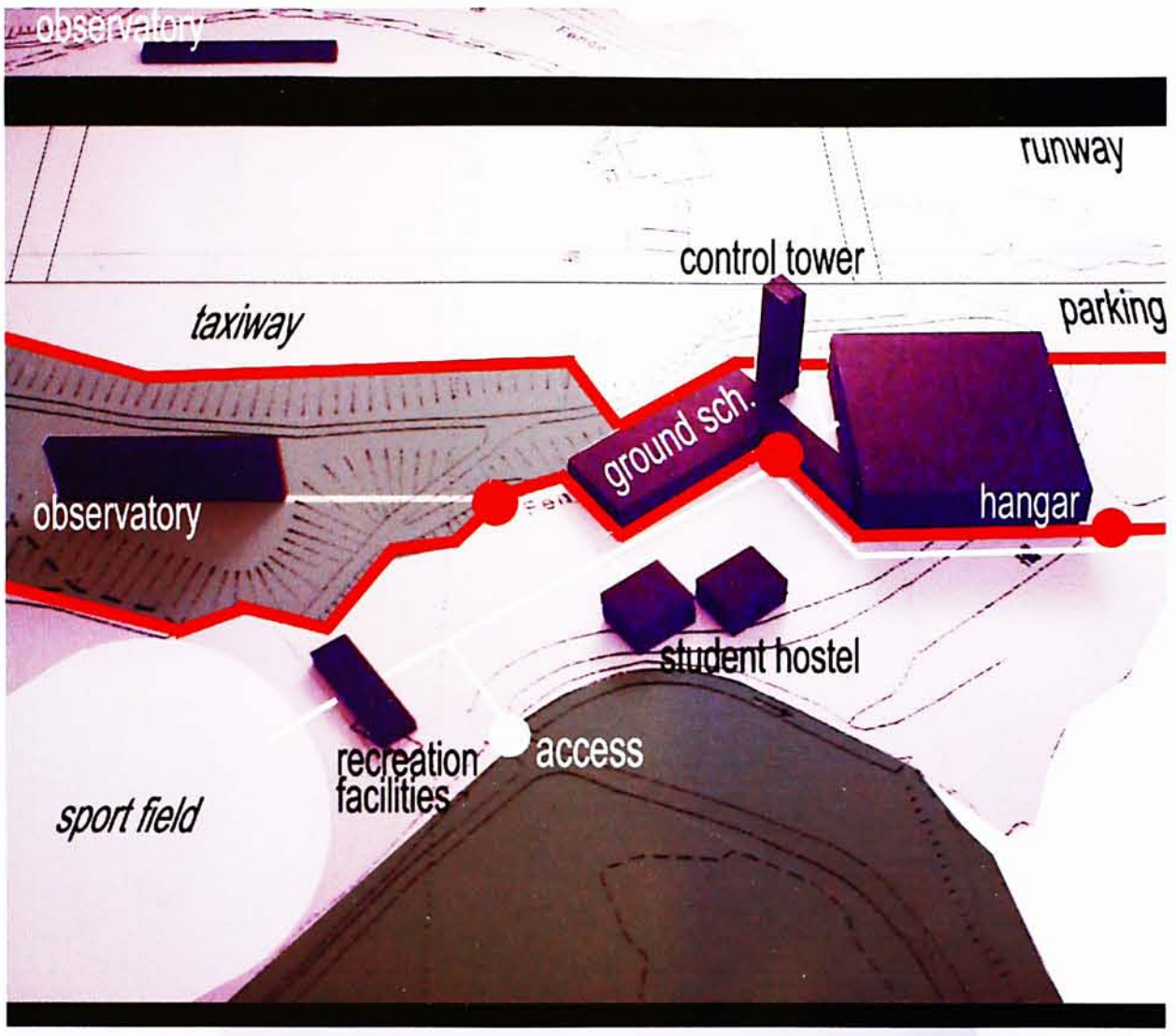
Professional -> **Training** -> Career -> tourism
Private pilot -> Practicing
General Public –> **Education / Exploration** -> hobby / culture
-> **Transportation** -> options
Hong Kong -> Investment **-> human resources + city image**

05

Design / **Master plan**

- Mass model
- Master site plan

05master plan



Mass model

Zoning
3 discrete zones
(general, building mass as isolation, air field)

Isolation
keep existing berm and main building mass as isolation

Facilities
group major facilities (ground school, hangar and control tower)

Controlled access points to airfield
1. for public observatory
2. through main building for training
3. for private pilot)

seeing

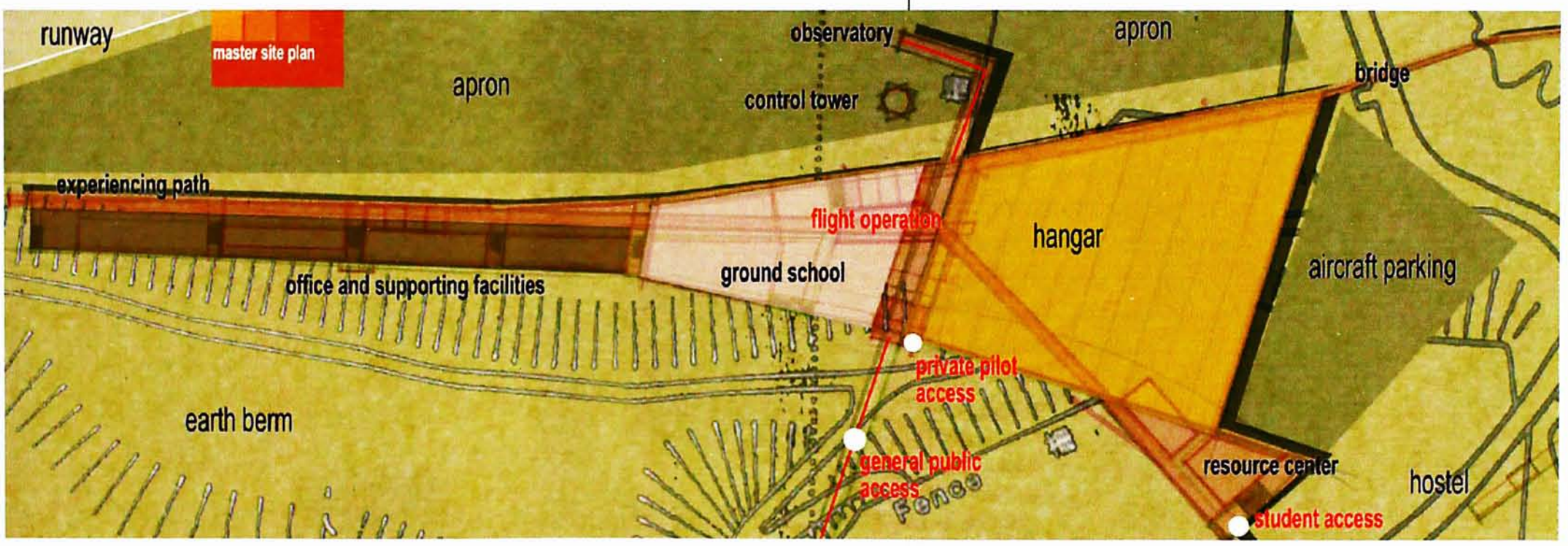
05master plan

Master site plan

Composition
The whole building mass is composed of four components, resource center, the hangar, flying school and services.

Form
The linear arrangement reacts with the runway. It indicates the sense of arrival and departure by its diverging relationship. The gigantic linear facades express the relationship of building and sky.

Access
Private pilots enter the central hub and flight operation through the main access. An elevated access for general public connects the Maonshan railway terminal. Separated access for cadet pilot from hostel to flying school.

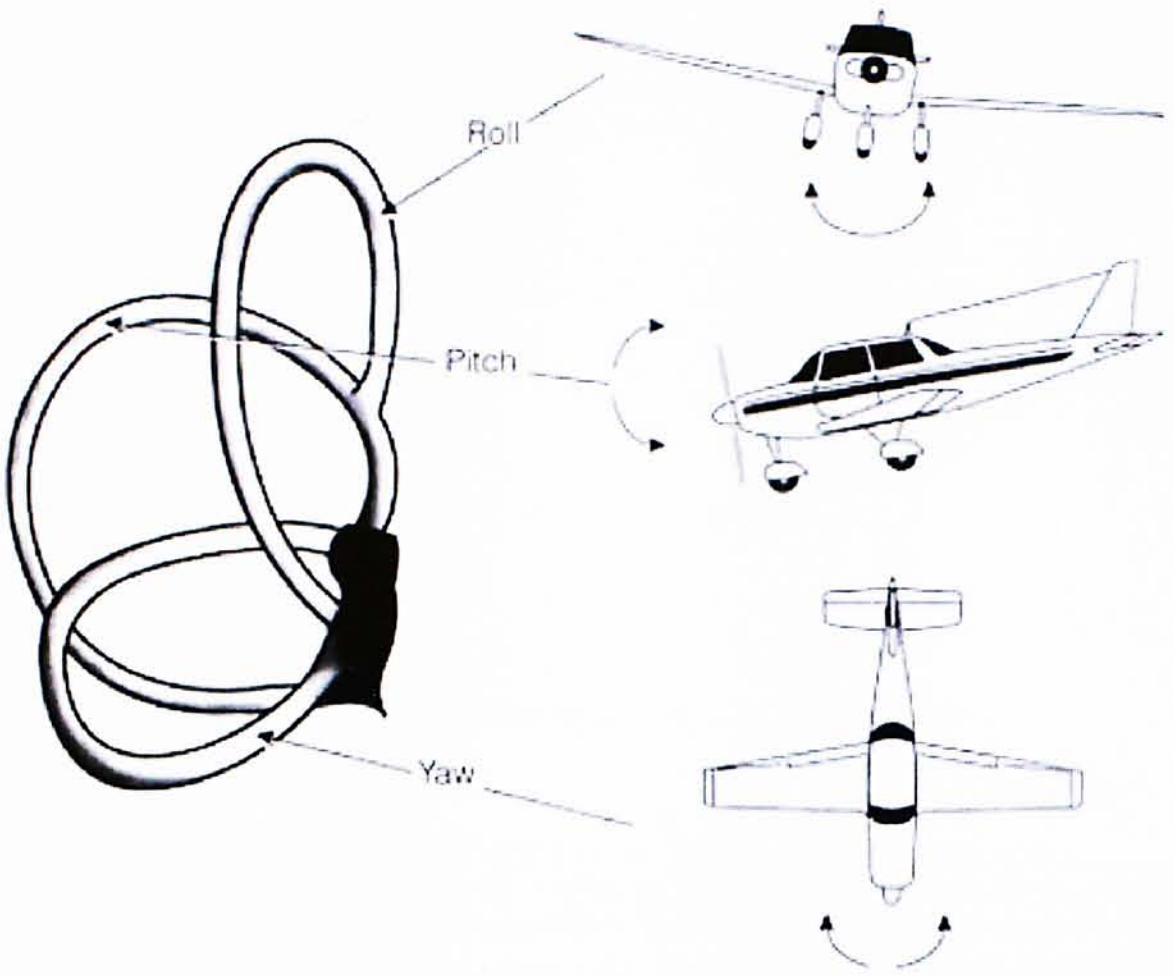


06

Design / **Preliminary**

- Design approach
- Design ideas
- Floor layout
- From motion to sensation
- Experiencing aviation by general public
- Experiencing aviation by pilot
- Working Model

06prelim.design



Design approach

The **motion** of aircraft would play an important role and inspire the space design while the spatial design is to be coordinated with the motion of aircraft from taxiing, taking off and landing. The **motion** of aircraft and human beings would change the definition of **space** from time to time as an interactive process. And, human acts as a component in the spatial definition. The intention is to capture the **space** definition to communicate with the users by their **sensations**.

[inspiration] Motion -> sensation

[interaction] Motion <-> space design

[intention] space definition -> sensation

06prelim.design

Design ideas

To stimulate a specific sensation for a certain motion through space design.

concept 1 the observatory from both higher level and ground level to **sense** the taking off and landing of aircraft

concept 2 path from Indoor through a large void (hangar) to entire open / horizon forming a **sequential spatial experience**

concept 3 connect sky and ground. The building is designed with the idea to in line with horizon and touching the sky.

concept 4 to simulate the flying actions through sequential spatial experience with relation from inside to outside reacting with the horizon

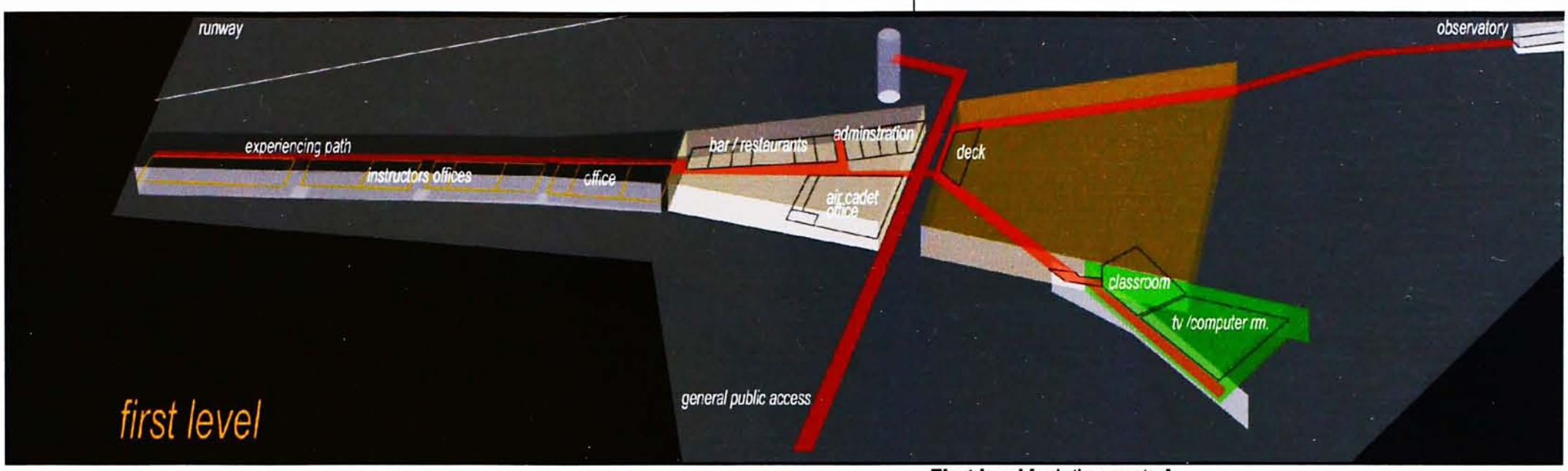
Design for general public, cadet pilotsand private pilots

> In terrestrial speeds (horse, automobile, train), plants, houses, etc., hurling themselves against us, the closest ones moving quickly, the distant ones less quickly, form a dynamic wheel in the frame of the horizon of mountains sea hills lakes, which itself moves, but so slowly that it seems to stand still. Beyond this immobile frame, there also exists for the eye the horizontal continuity of the plane on which one travels.
> In aerial speeds, on the other hand, these continuities and this panoramic frame are lacking. The aeroplane, which glides, dives, climbs, etc., creates an ideal hypersensitive observatory suspended everywhere in the infinite and made dynamic by the consciousness of movement itself, which alters the value of the minutes and seconds of vision-sensation. Time and space are pulverised by the flashing verification that the earth quickly moves under the immobile aeroplane.

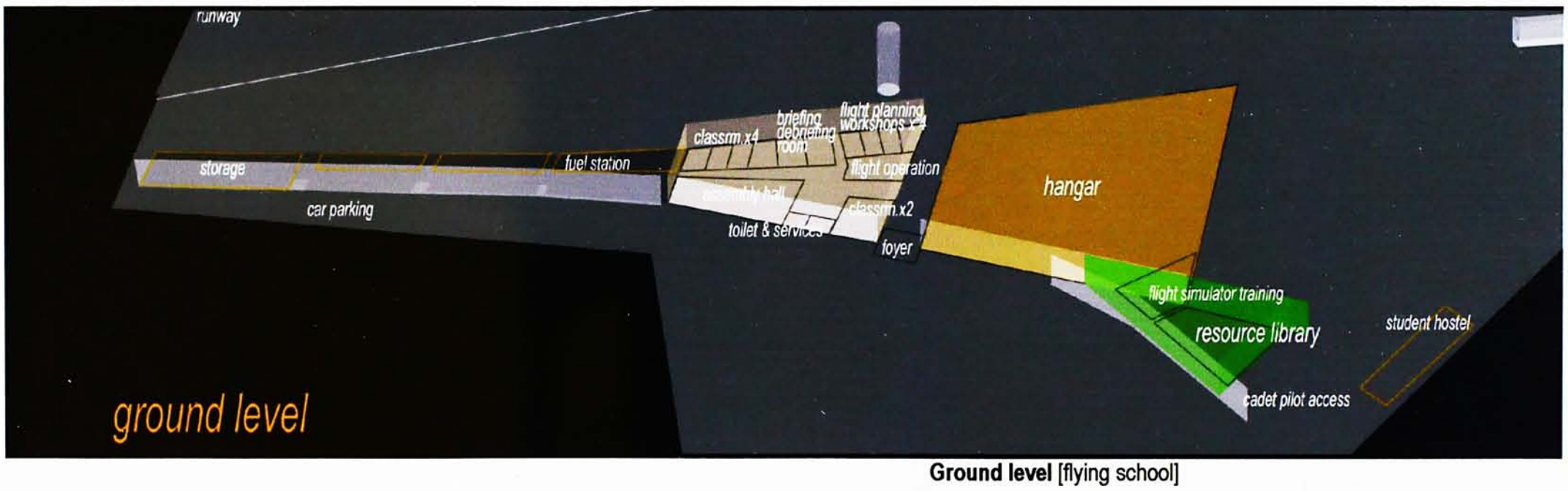
F.T. Marinetti, *The First Statement in the World of a New Italian Art; Aeropainting, Giornale delta Domenica,* Rome, 1-2 February 1931
(FUTURISM and FUTURISTS website http://www.futurism.org.uk/futurism.htm)

06prelim.design

Floor layout



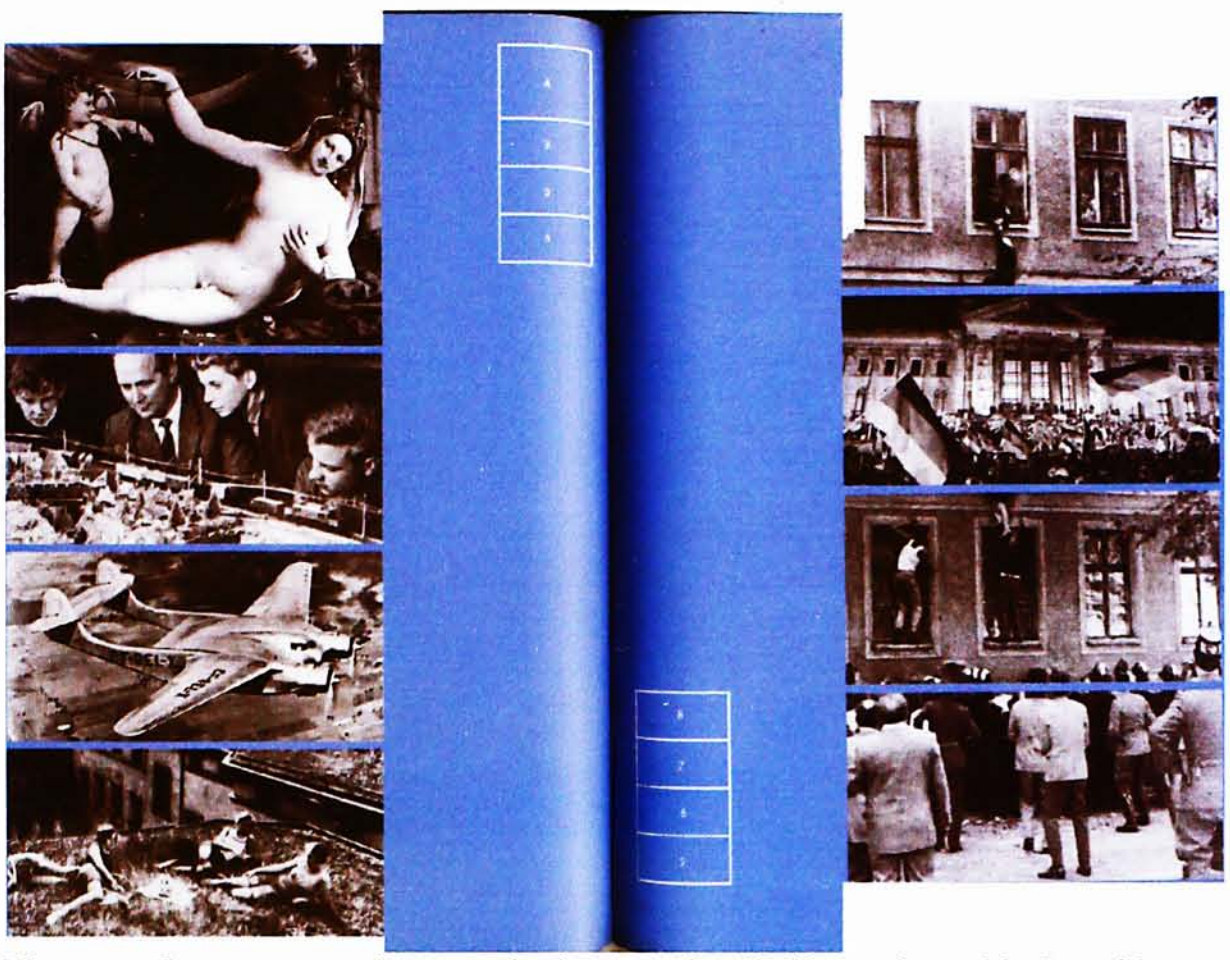
First level [aviation center]



Ground level [flying school]

[precedent study]

Mack, Gerhard. ***Eberswalde Library : Herzog & de Meuron.*** **Architectural Association, c2000.**



*** CBY-3 prototype aircraft**

The use of newspaper photographs is central to Ruff's work, and before this commission he had already produced a comprehensive body of work in which 'found' images were treated in various ways (although always thematically). He employed the same approach for the library façade, but faced two new factors: the vertical alignment of the individual motifs, and their outdoor location.

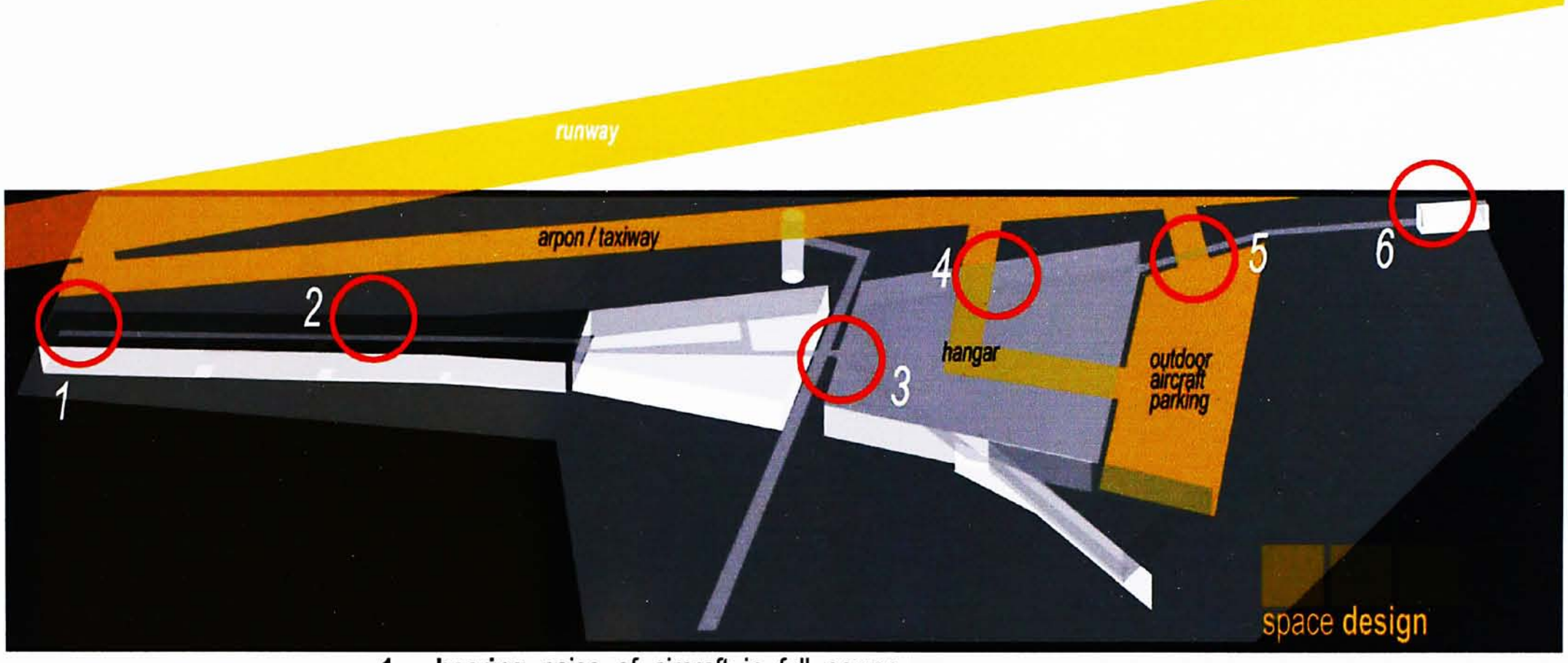
The choice of images was never guided by the kind of pseudo-aesthetic whimsy that initial responses to the work have tended to suggest. But nor was it a random selection. Instead, Ruff proceeded from the principle that the library is a public building whose function is 'to store knowledge and make it accessible' and in doing so 'to develop historical and social awareness'. This awareness was projected in the form of specifically chosen extracts from a visual diary, made up of newspaper photographs related to the arts, history, politics and science, that the artist has been compiling since 1981. Most of the images for the Eberswalde Library are taken from the German weekly current affairs magazine, Die Zeit, from 1992 to 1993. Arranged in a sequence beginning on the ground level and rising up to the very top of the building, they portray history and science in a skeptical light. The sequence of images is framed, above and below, by a snapshot of 1920s Berlin, showing some young women on a roof garden listening to the radio. At the foot of the building the image establishes an unusual contrast with the stone pavement, **whist at the top it forms an apt transition to the grass-covered roof. Blurring the distinction between roof and ground, grass and sky**, the work also addresses the categories of high and low, which can in turn suggest an engagement with social values such as good or bad, strong and weak.

insight treatment on roof towards sky /
blurring the distinction between roof and sky

06prelim.design

From motion to sensation

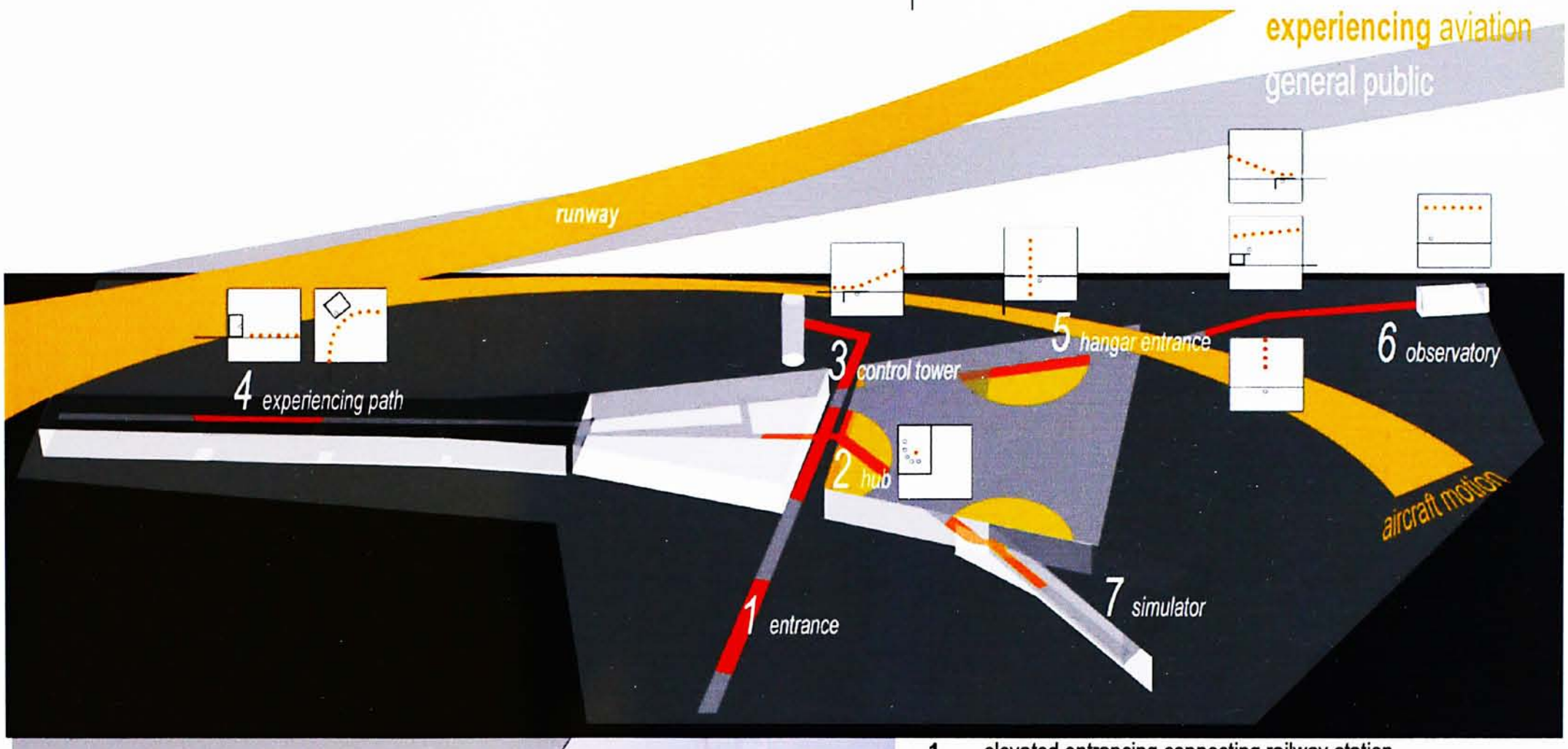
aircraft **motion**



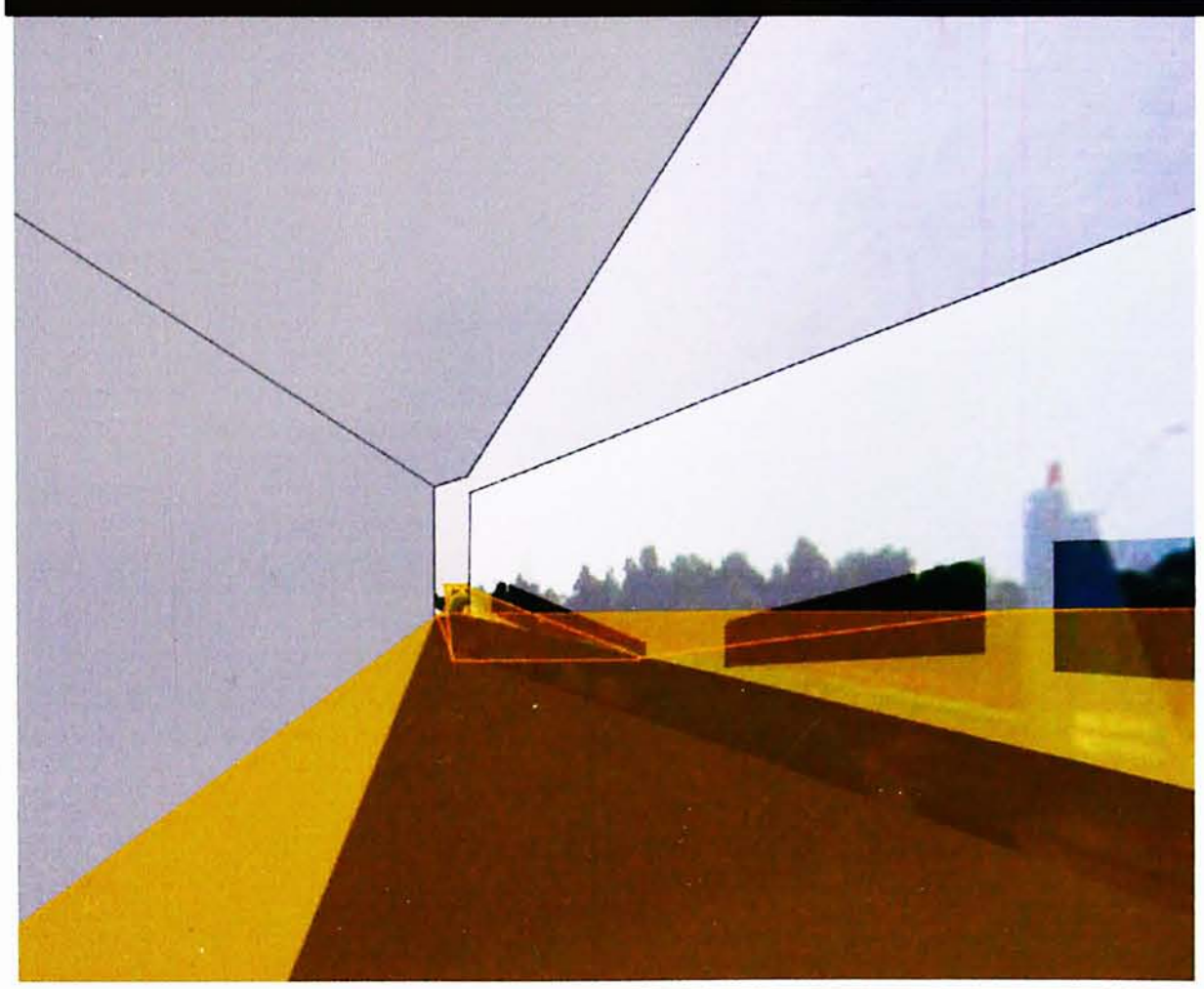
1. **hearing** noise of aircraft in full power
seeing the moment before taking off
smelling power of engine and fuel
2. **hearing** noise of aircraft in taxiing
seeing aircraft motion on ground level
touching wind motion
3. **hearing** resonance in a large void space
seeing aircraft being repaired and tested
smelling fuel and gasoline
4. **hearing** noise of aircraft in taxiing
seeing aircraft taking off
smelling grass field and open air
touching wind motion
5. **hearing** aircraft in starting engine
seeing aircraft turning from high level
6. **hearing** wind motion
seeing aircraft climbing and cruising
smelling sea water

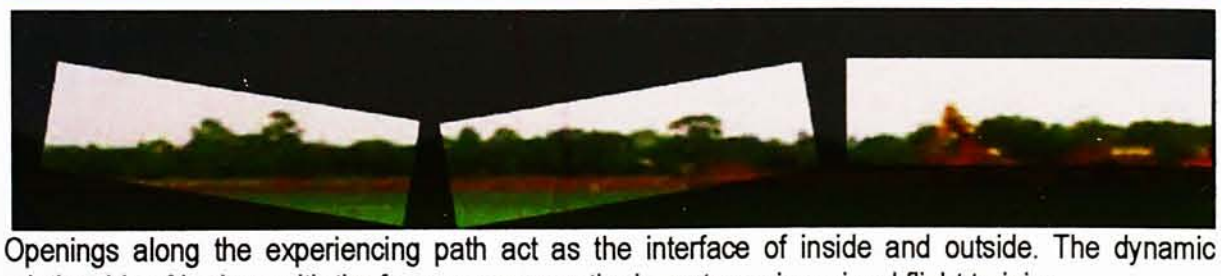
06prelim.design

Experiencing aviation by general public

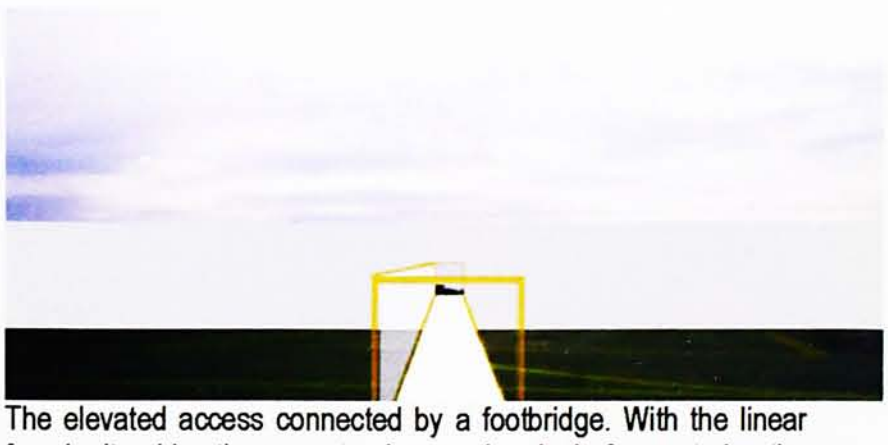


1. elevated entrancing connecting railway station
2. hub – observing flight operation and hangar
3. opening to observe the apron and control tower
4. experiencing path brings visitors to the closet point to the starting point of runway
5. standing between hangar and apron to see the aircraft in a new dimension
6. observatory towards to touch the horizon
7. simulator located in resource center





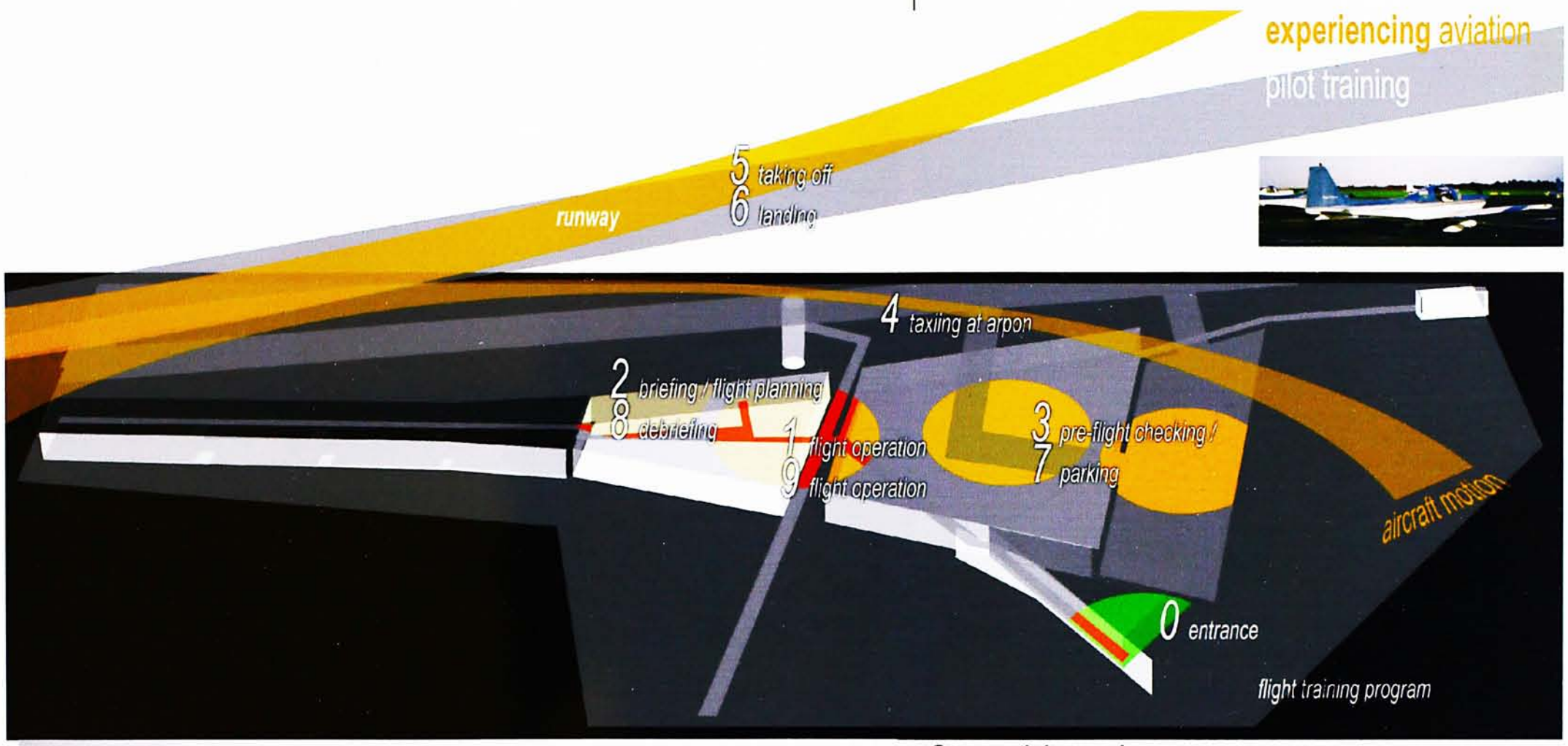
Openings along the experiencing path act as the interface of inside and outside. The dynamic relationship of horizon with the frame expresses the importance in a visual flight training.



The elevated access connected by a footbridge. With the linear façade, it guides the users to observe the sky before entering the aviation center.

06prelim.design

Experiencing aviation
by cadet pilot



observing wind direction and runway situation is essential for flight planning, briefing and debriefing.

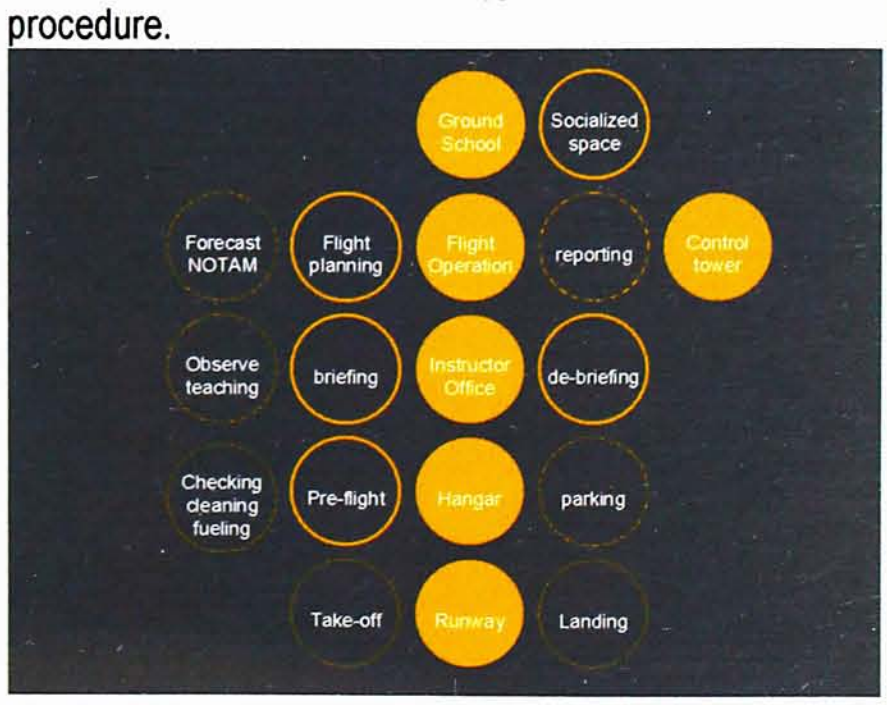
<u>Sequential experience</u>

0 → 1 walking through the hangar to touch the aircraft

2 → 3 from indoor thro an internal spine to a large void

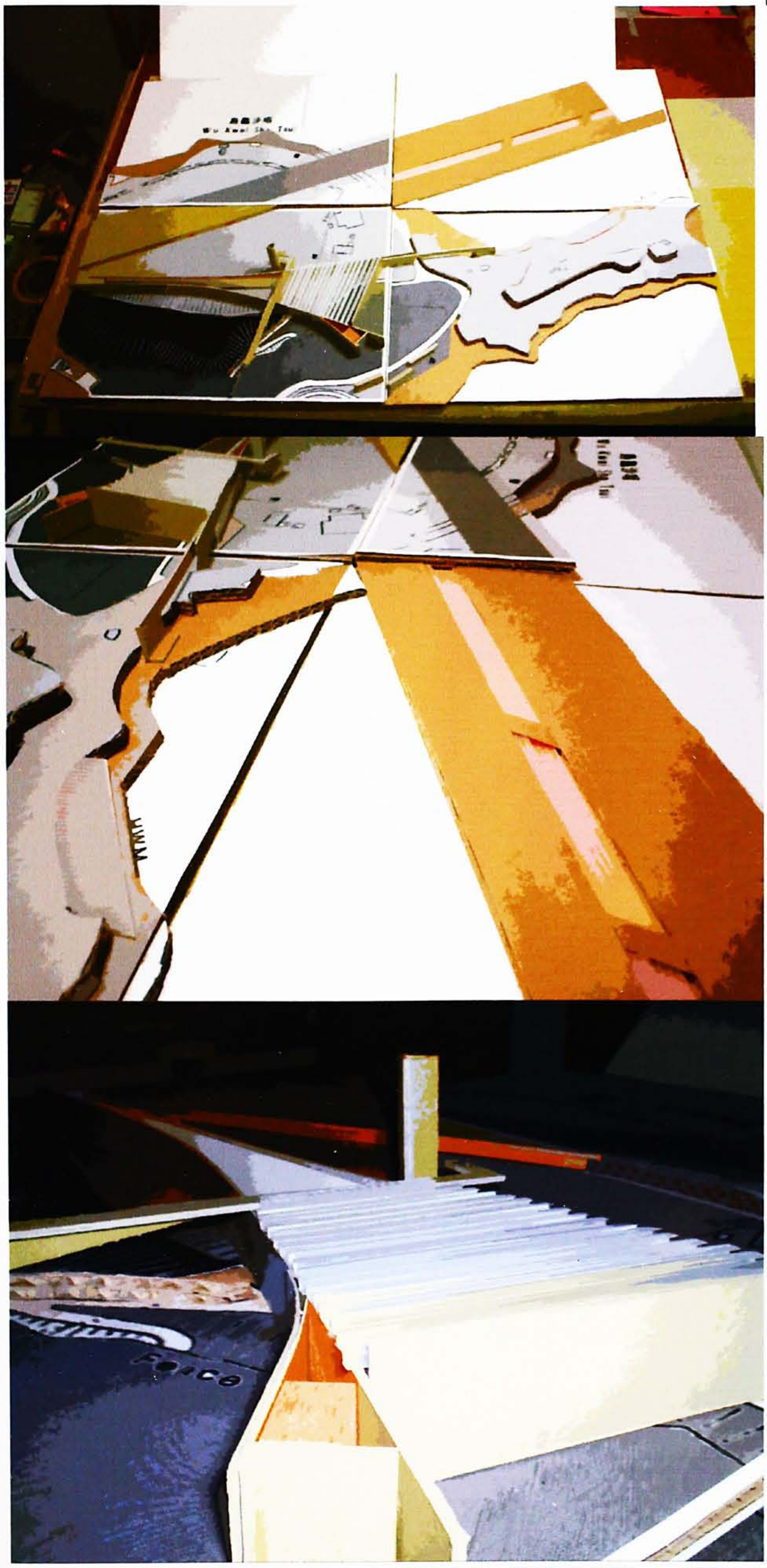
3 → 4 from a large void to entire open to touch the horizon

The numbers indicates a typical flight training procedure.



06prelim.design

Working Model



Reclamation for part of runway

Diverging relationship of building mass and runway

Interconnecting spaces and volume

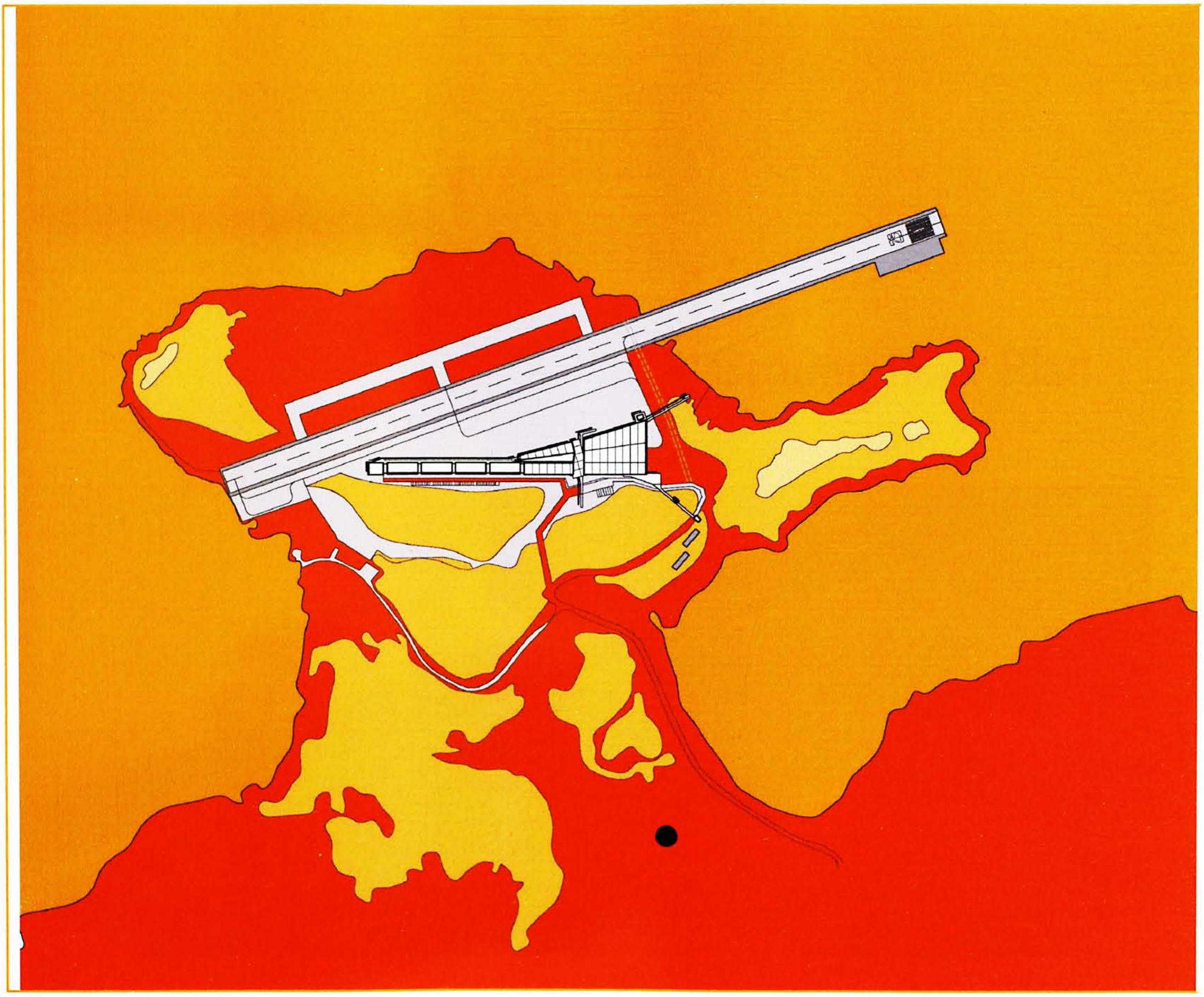
07

Design development

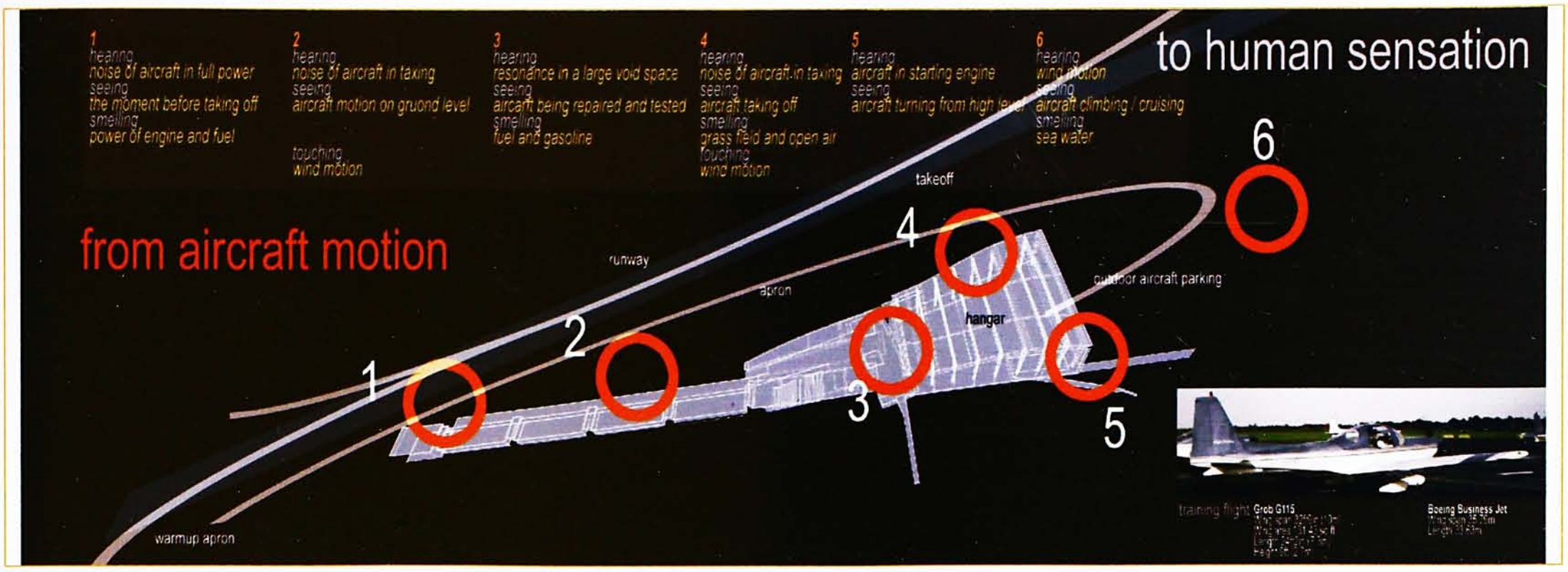
- Site plan
- Ground floor plan
- First floor plan
- Elevation
- Section
- Model
- Structure
- Services
- Circulation and egress
- Flight planning workshop details/sectional perspective

07design development

Site Plan

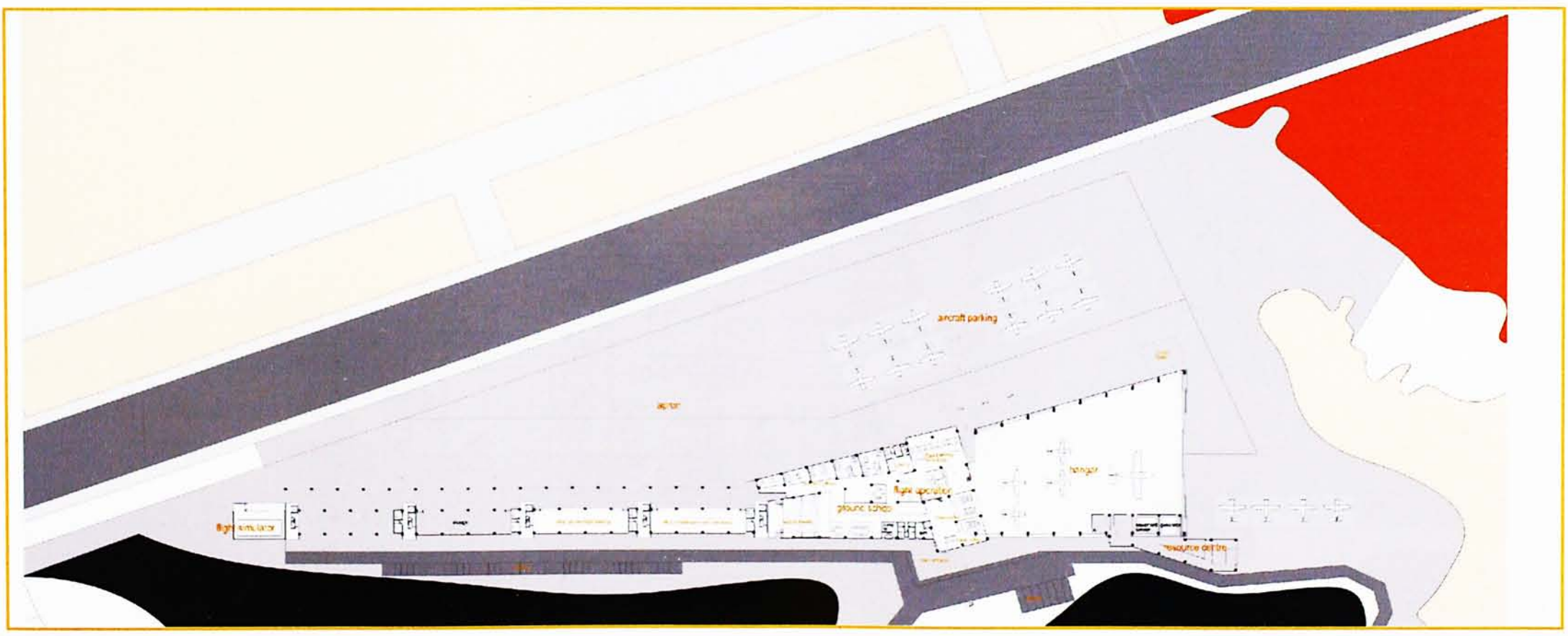


Future KCR maonshan railway station

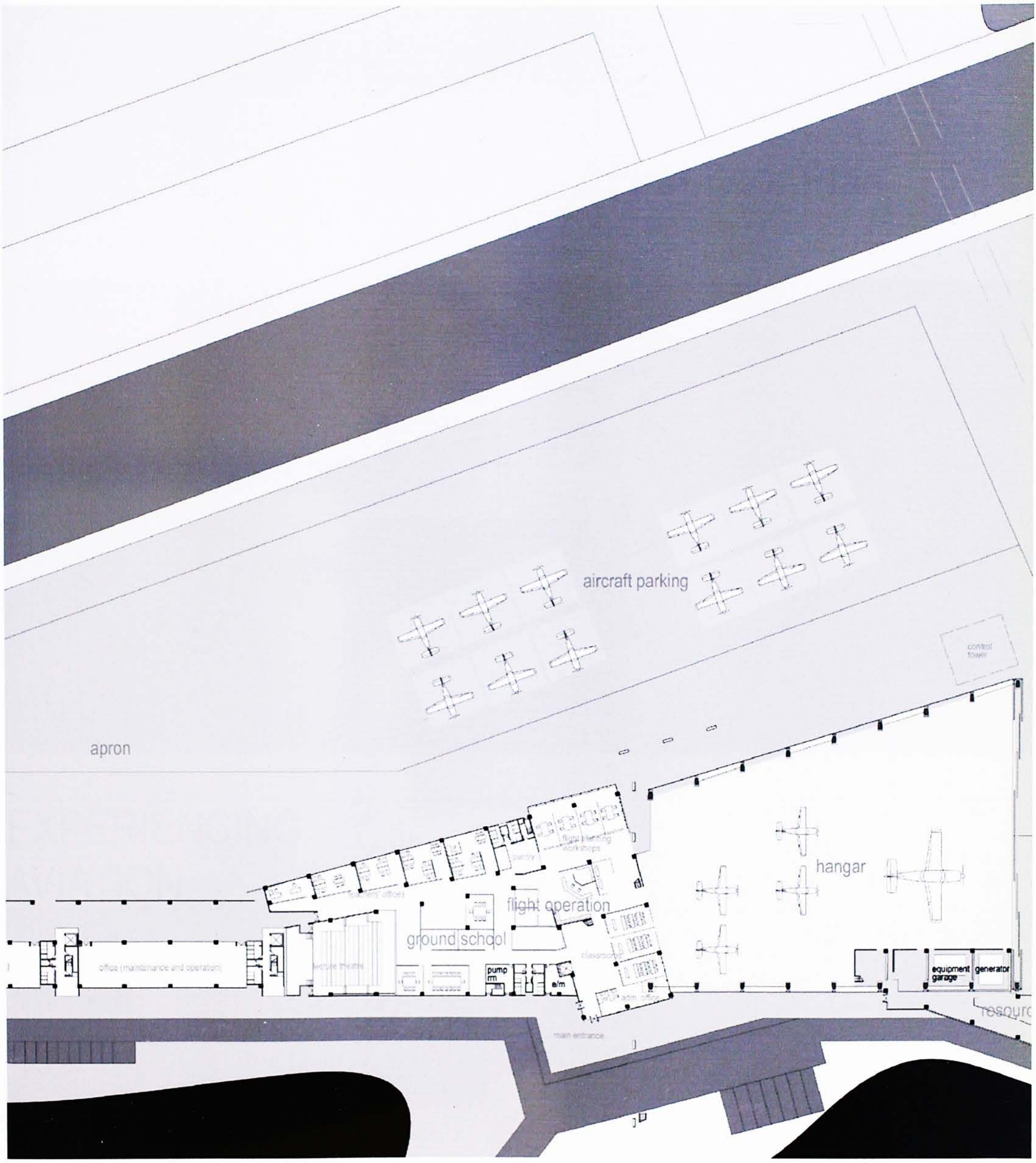


07design development

Ground floor Plan

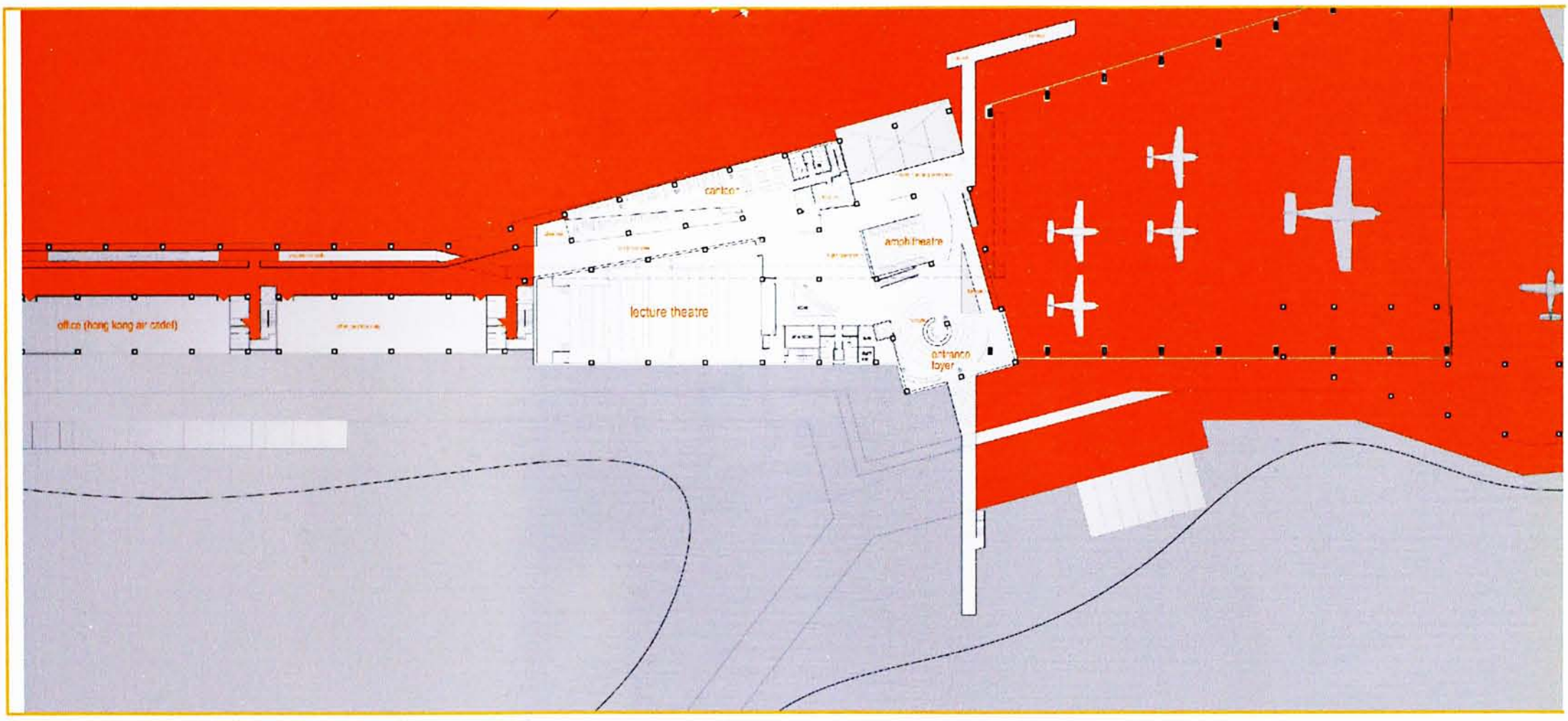


FLYING SCHOOL

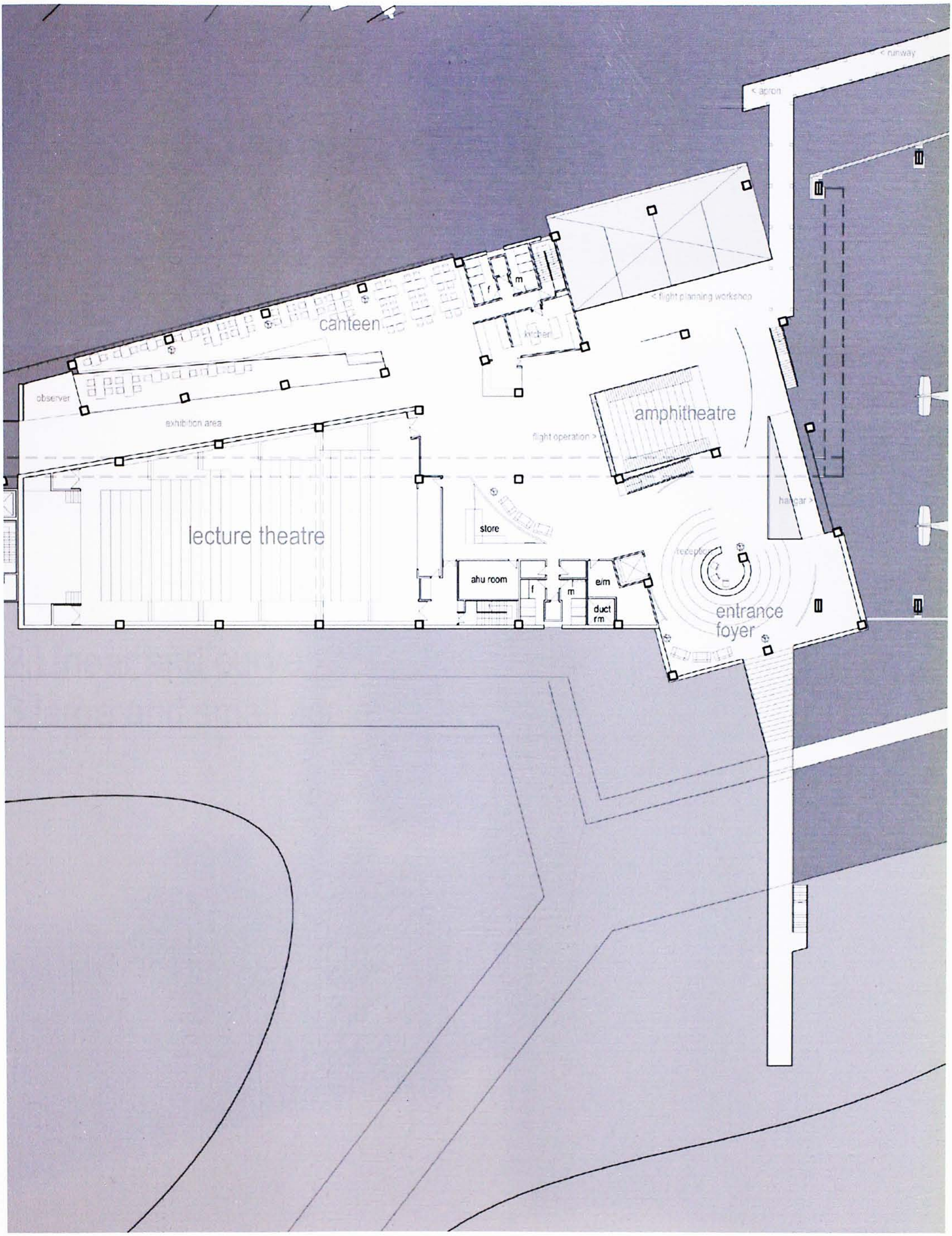

aircraft parking
control tower
apron
hangar
flight operation
ground school
office (maintenance and operation)
lecture theatre
pump rm
e/m
equipment garage
generator
main entrance

07design development

First floor Plan

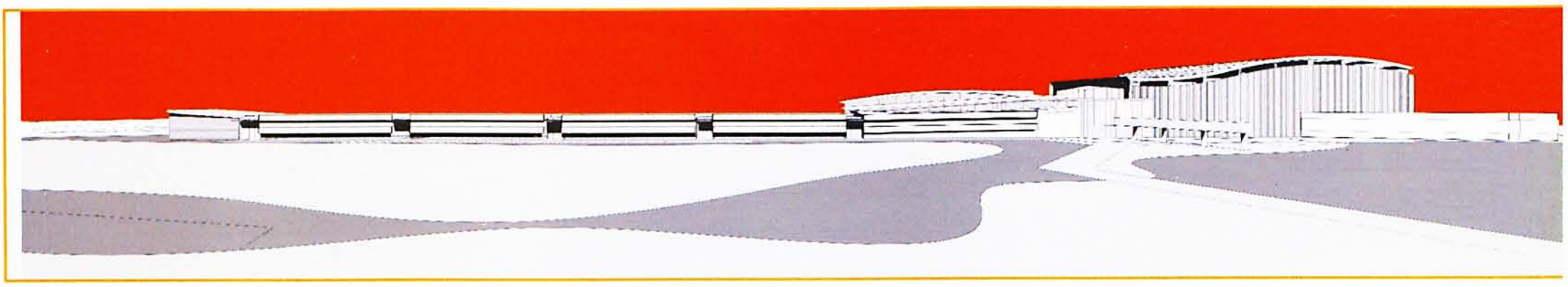


EXPERIENCING AVIATION


< runway
< apron
canteen
kitchen
< flight planning workshop
observer
exhibition area
amphitheatre
flight operation >
hangar >
lecture theatre
store
ahu room
f
m
e/m
duct rm
reception
entrance foyer

07design development

Elevation



Tectonic elements

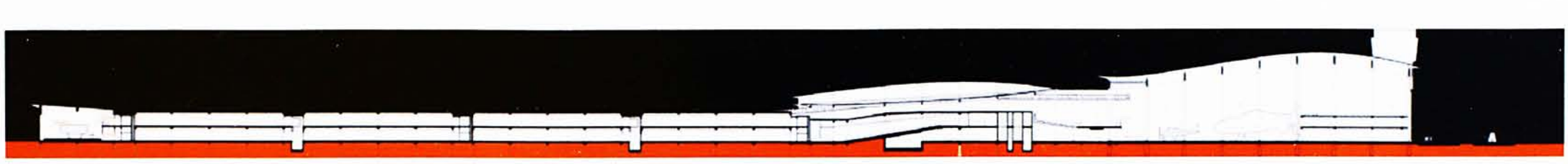
1.Vertical and horizontal
2.Linear and curve
3.large and small scale

South elevation glazing for daylighting

Hangar openings for introducing natural ventilation

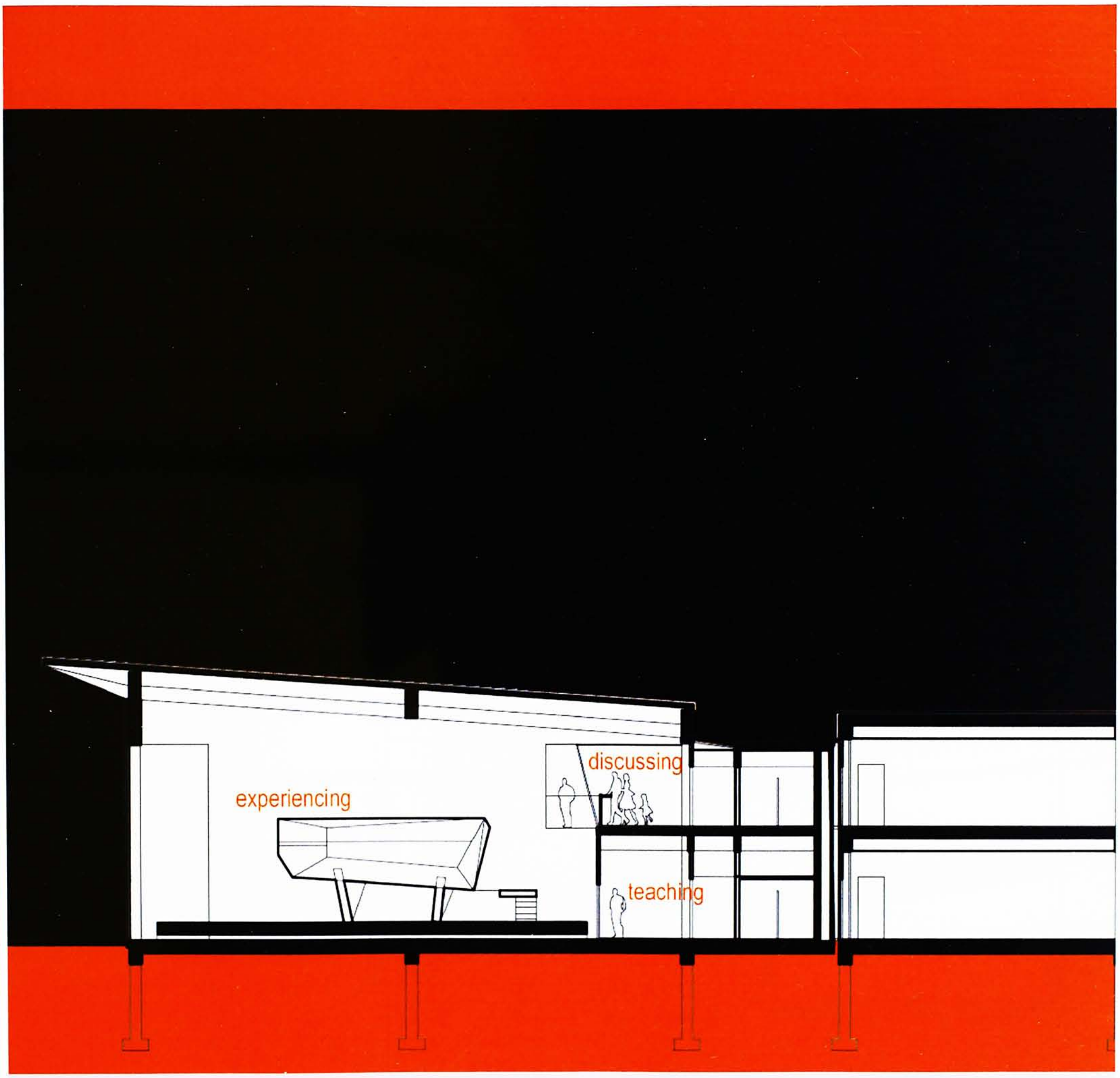
07design development

Section



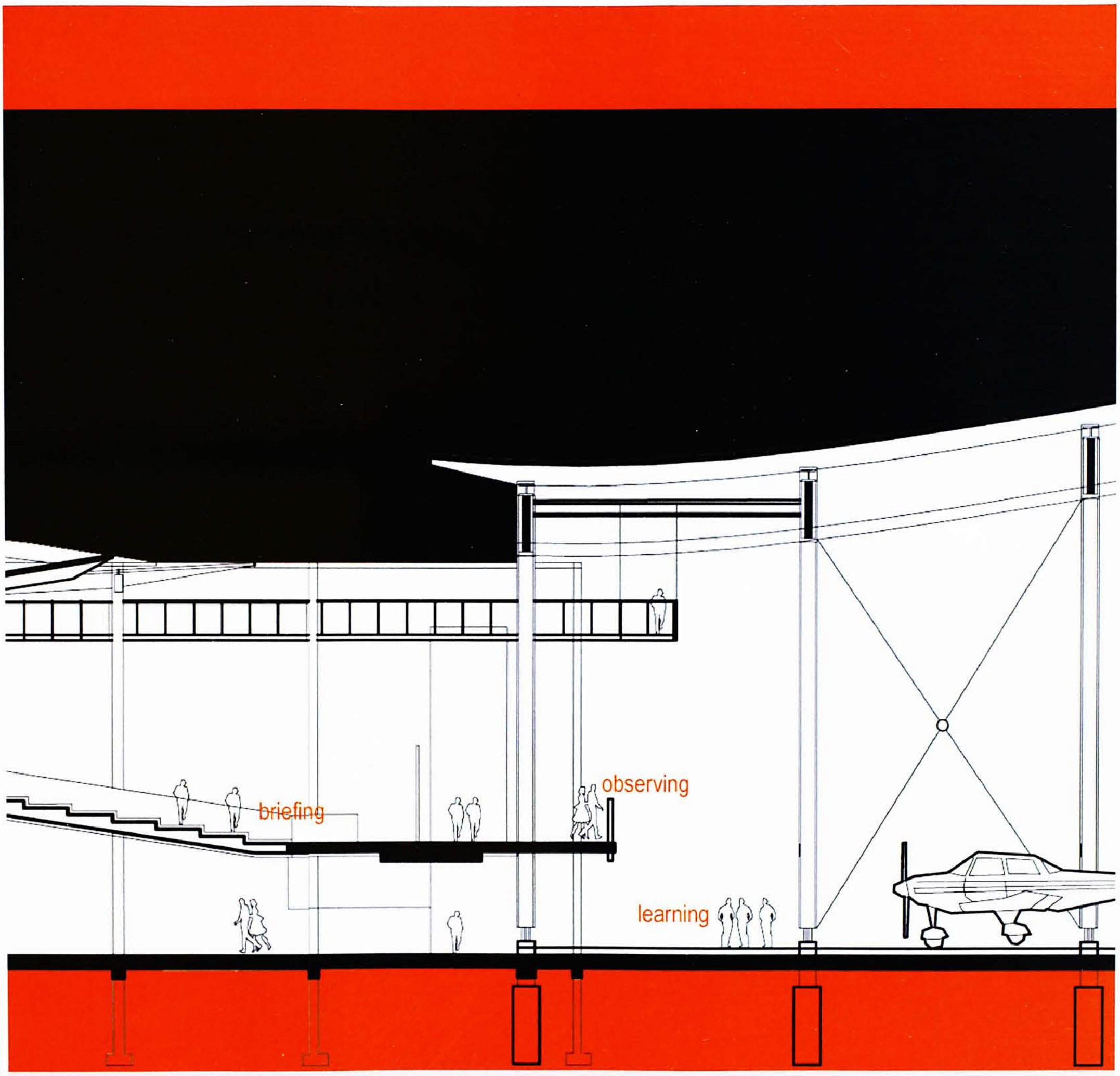
Tectonic elements

1. Vertical and horizontal
2. Linear and curve
3. large and small scale



Flight simulator

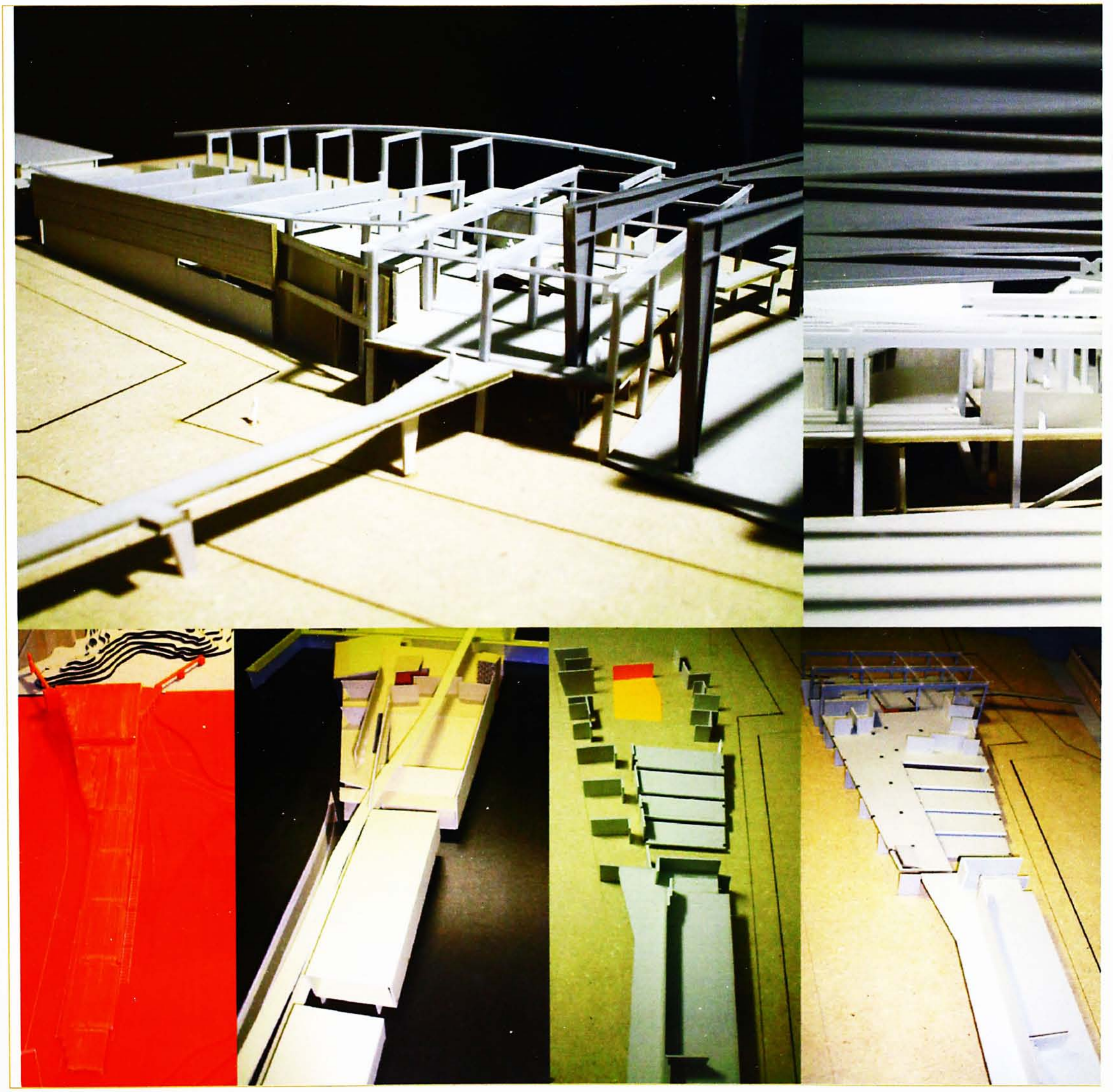
Lecture theatre



Interaction with various users

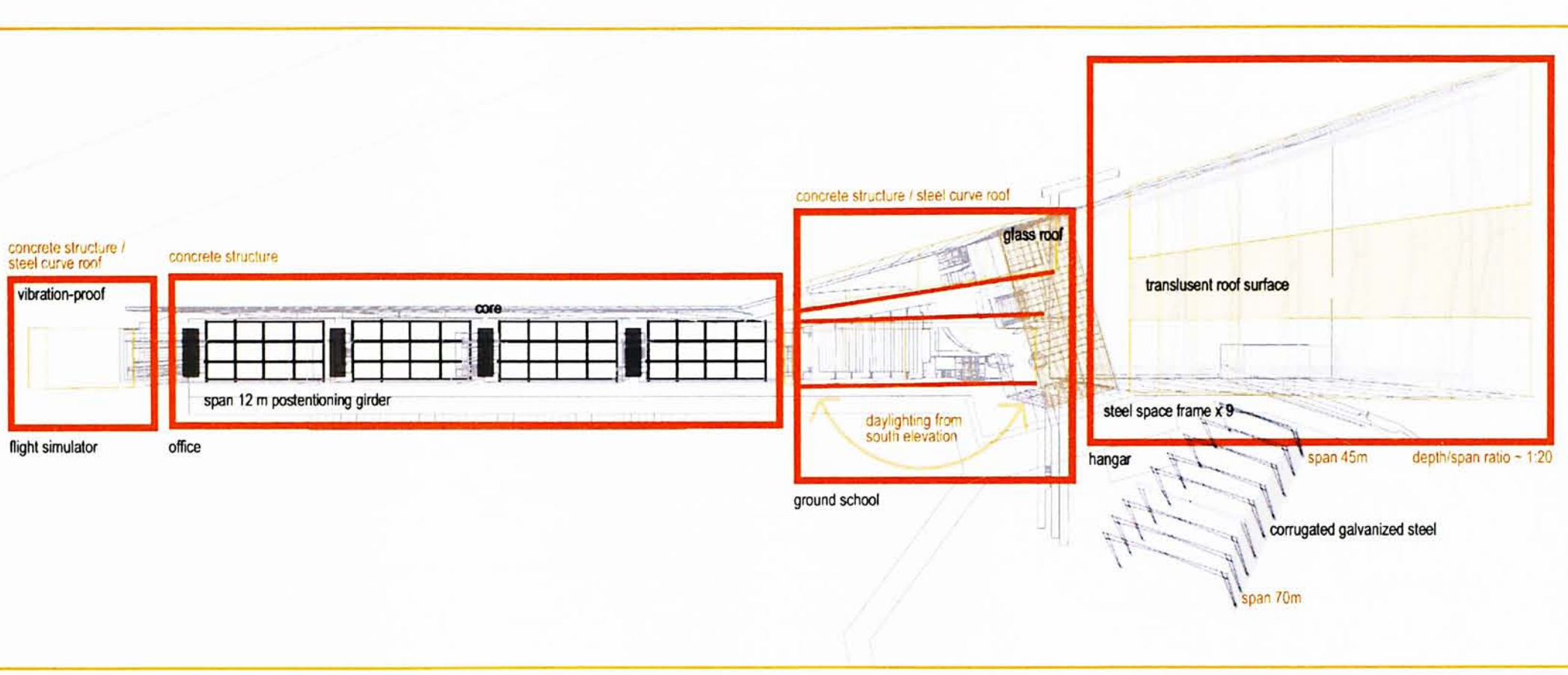
07design development

Models

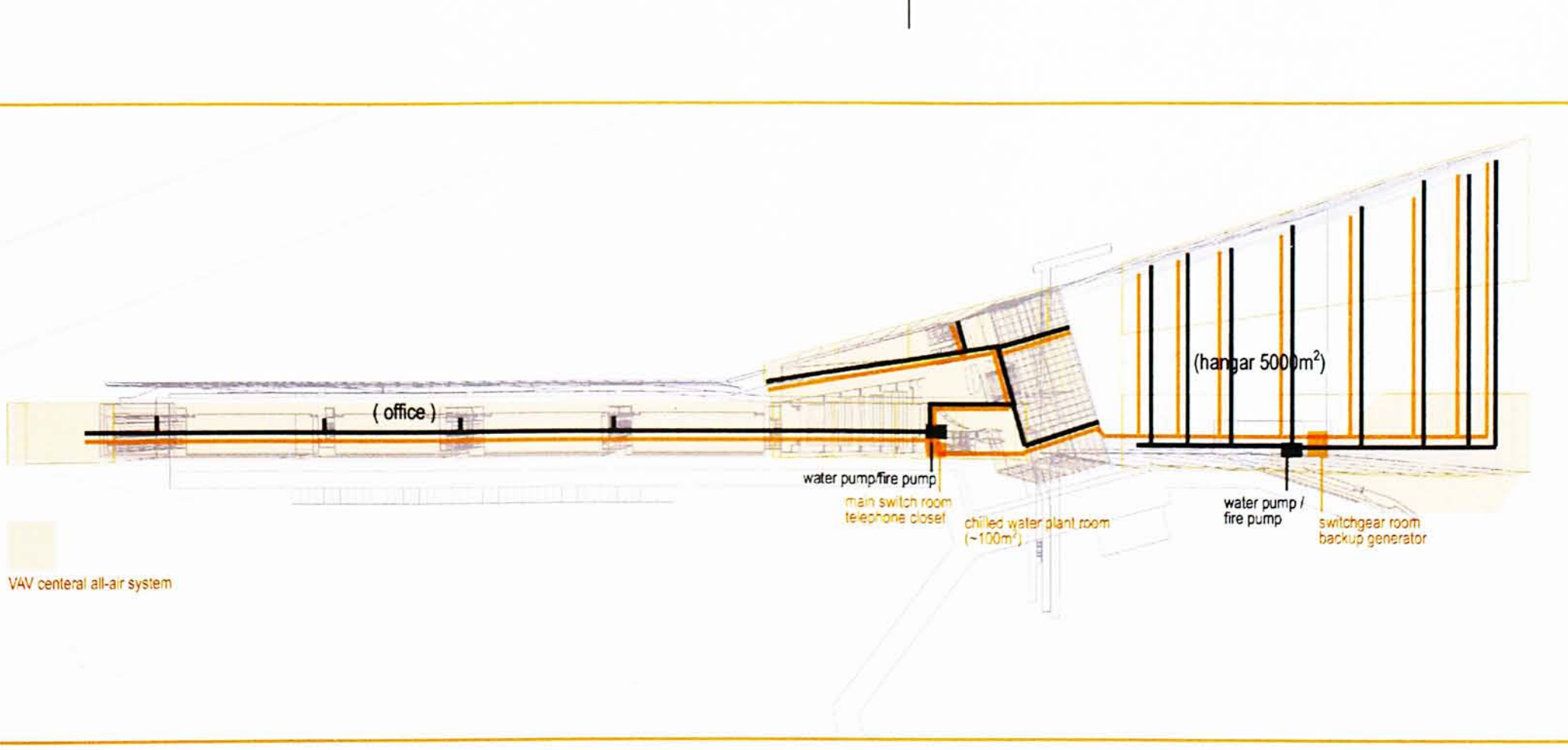


07design development

Structure

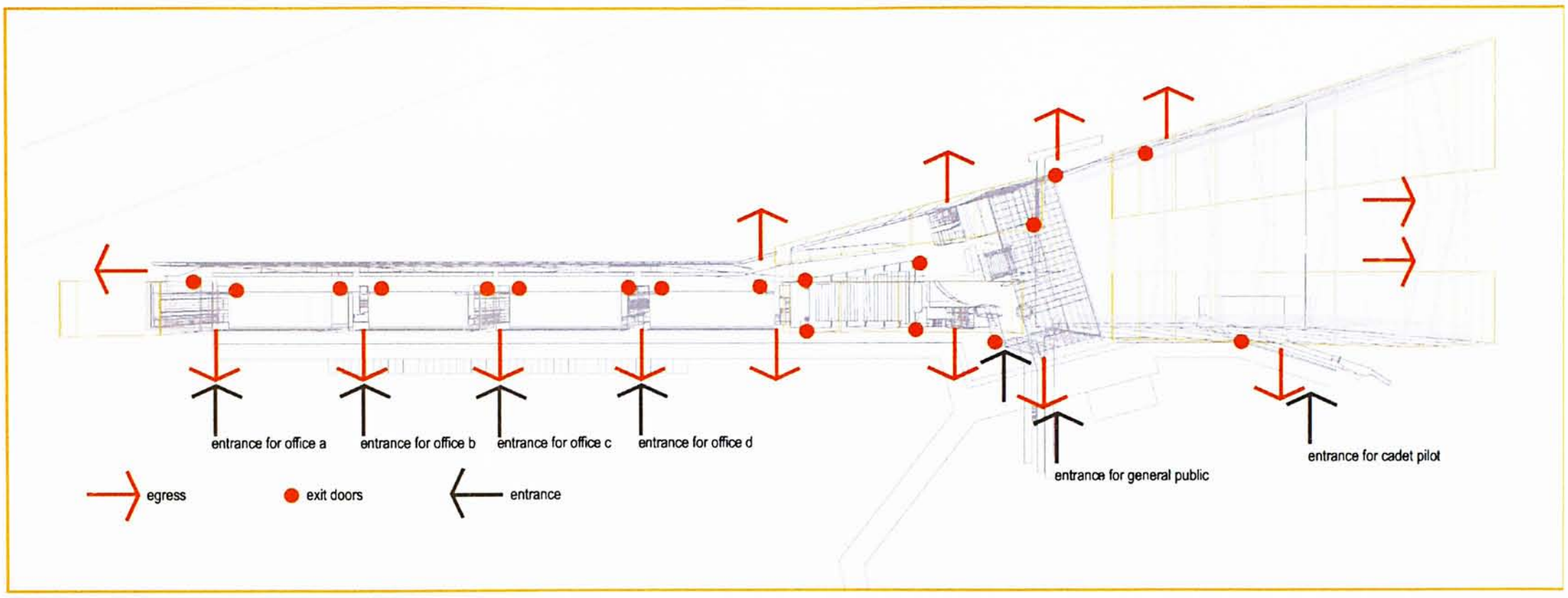


Services



07design development

Circulation and egress



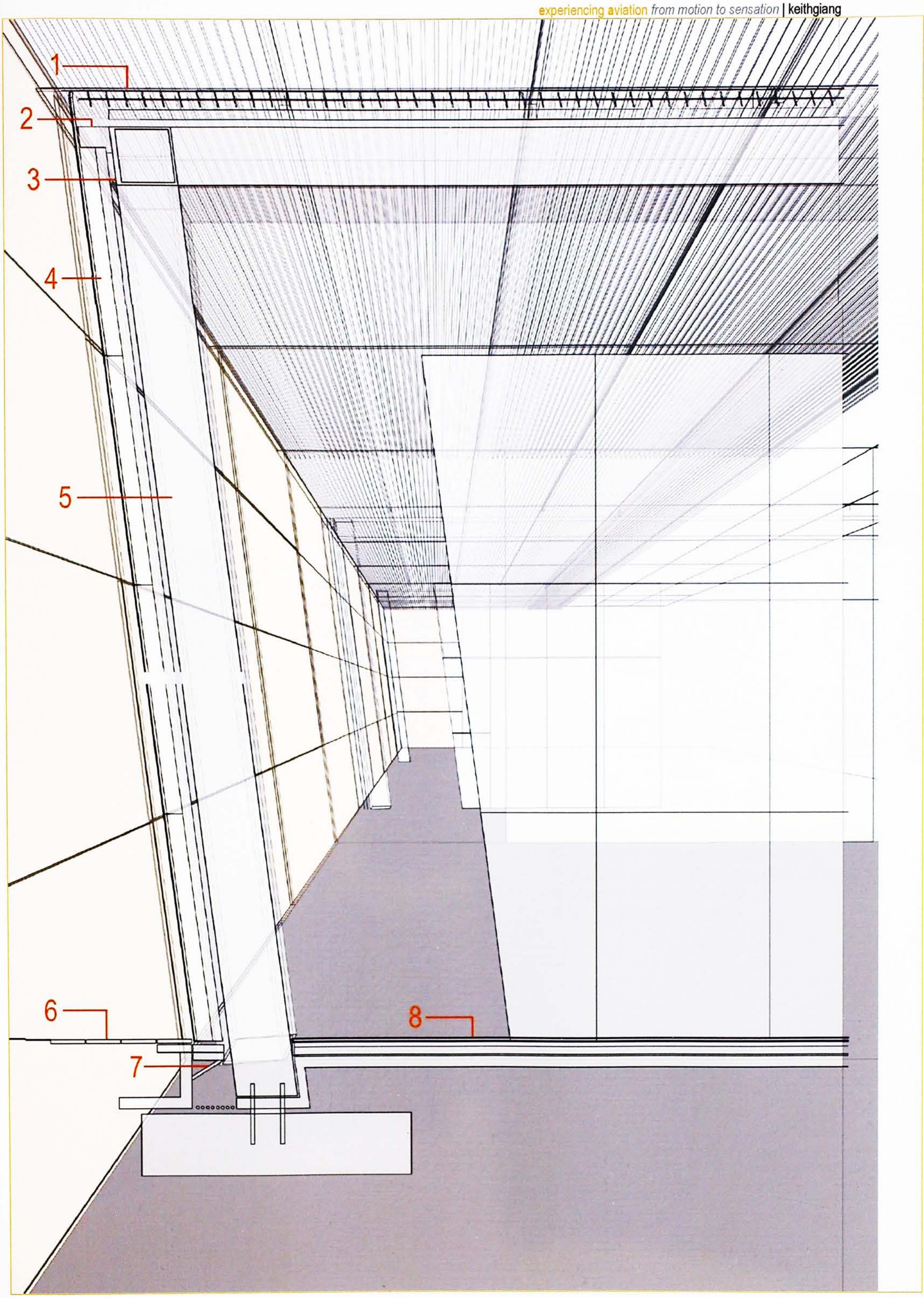
Interaction & Separation

07design development

Flight planning workshop
details/sectional perspective

1 double roof glazing with rebated edge
2 facade suspension, adjustable in height
3 welded steel box-section edge beam with integrated lamps
4 36/300mm glass bracking fin
5 double column with welded steel
6 80mm standstone slab paving on 50mm bed of chippings
7 steel bracket support for glass fins
8 floor construction:
40mm calcareous sandstone paving, 30mm -bed of mortar,
85mm steel-fibre-reinforced screed to udnerfloor heating on polythene separating layer
120mm rigid-foam polystyrene insulation bituminous sealing layer
300mm reinforced concrete floor slab

touching


1
2
3
4
5
6
7
8

08

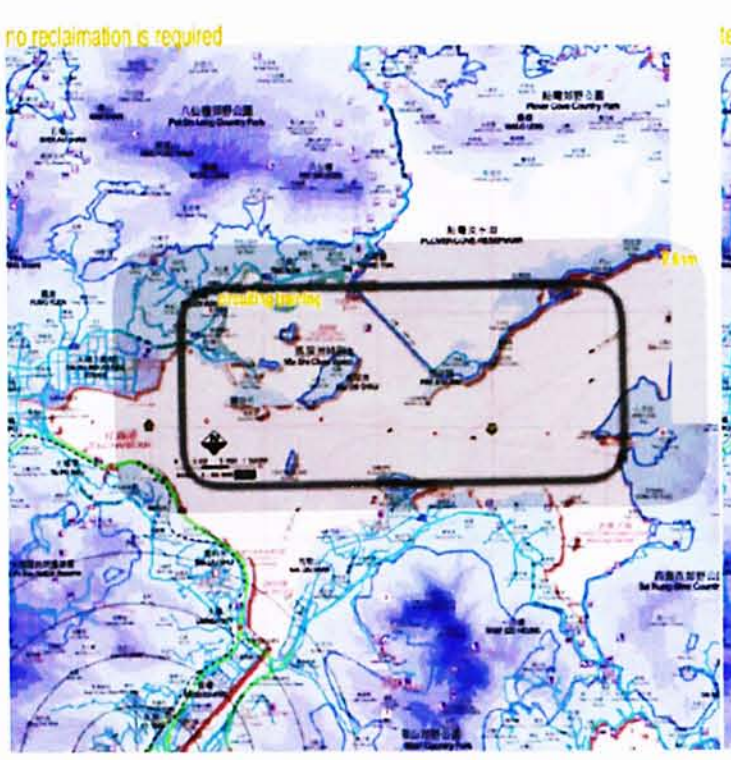
Design / special studies

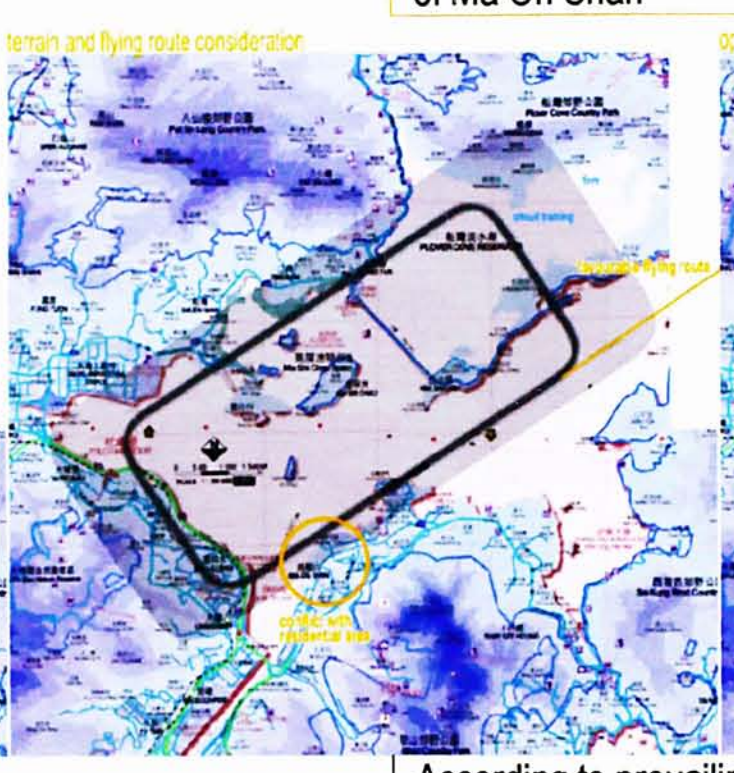
- Runway consideration
- Circuit training and flying route
- Approaching and landing
- Distribution of pressure under single-wheel loads
- Runway marking and surface material
- Runway, taxiway and parking apron cross section
- Runway marker placement
- Runway lighting layout

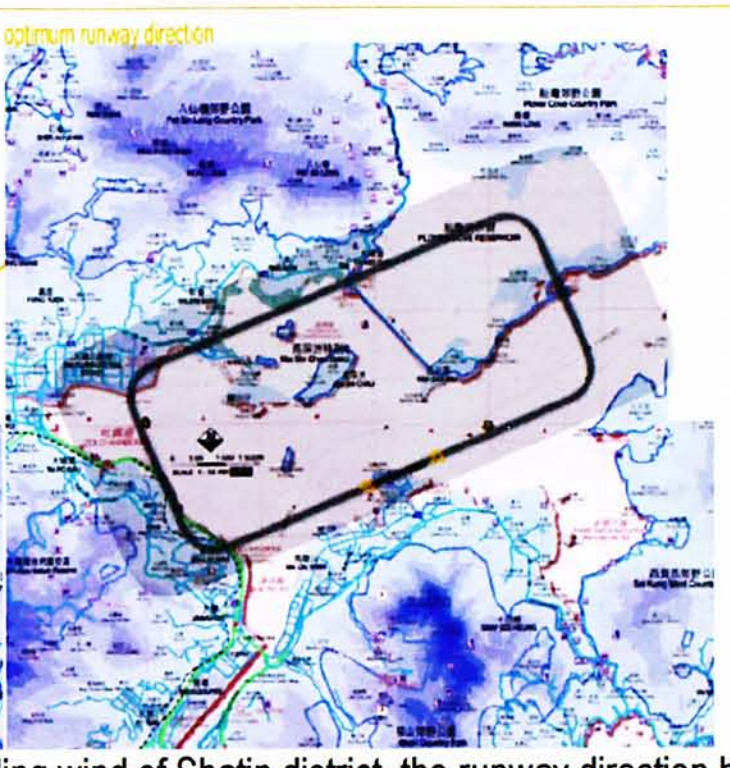
08design/ special studies

a. Runway consideration

Wind direction
Terrain to accommodate the possible circuit training, for 2.6 nautic miles* diameter
Flying route be far away from dense residential area of Ma On Shan







According to prevailing wind of Shatin district, the runway direction h been determined. By considering the favorable flying route towar training airspace and the site terrain for accommodating a typic circuit training, the runway direction is almost set. Thus, the runw has to be shifted to be far away from most dense MOS resident area as much as possible.

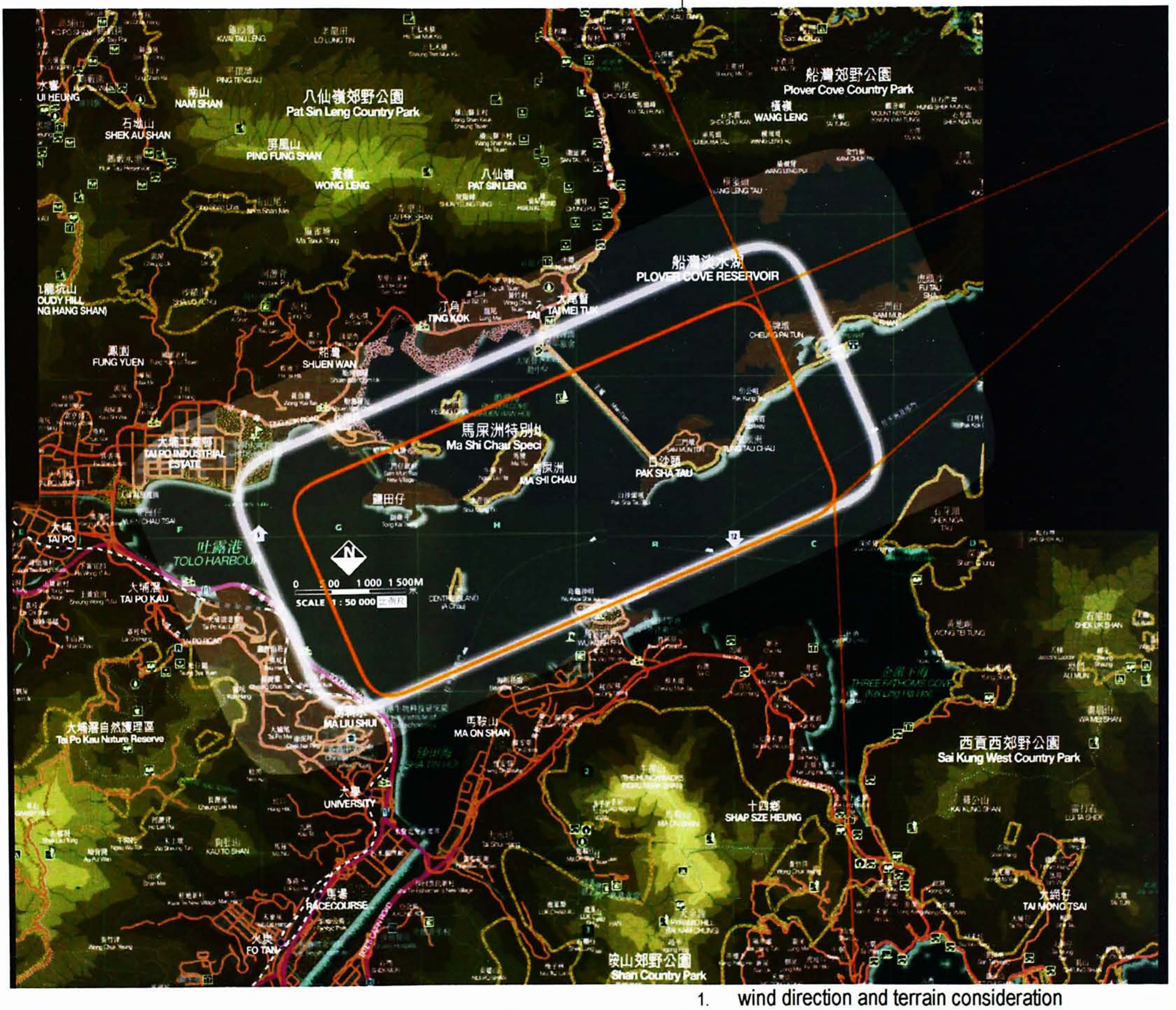
Reference / dimension of Runway

Kai Tak (1958) 2529m
Kai Tak (1975) 3390m
CLK 3800m x 60m
Sek Kong 1263m x 34m
Training Aircraft runway about 1100m x 10m

*** Circuit training /1nm=1.85km**

08design/ special studies

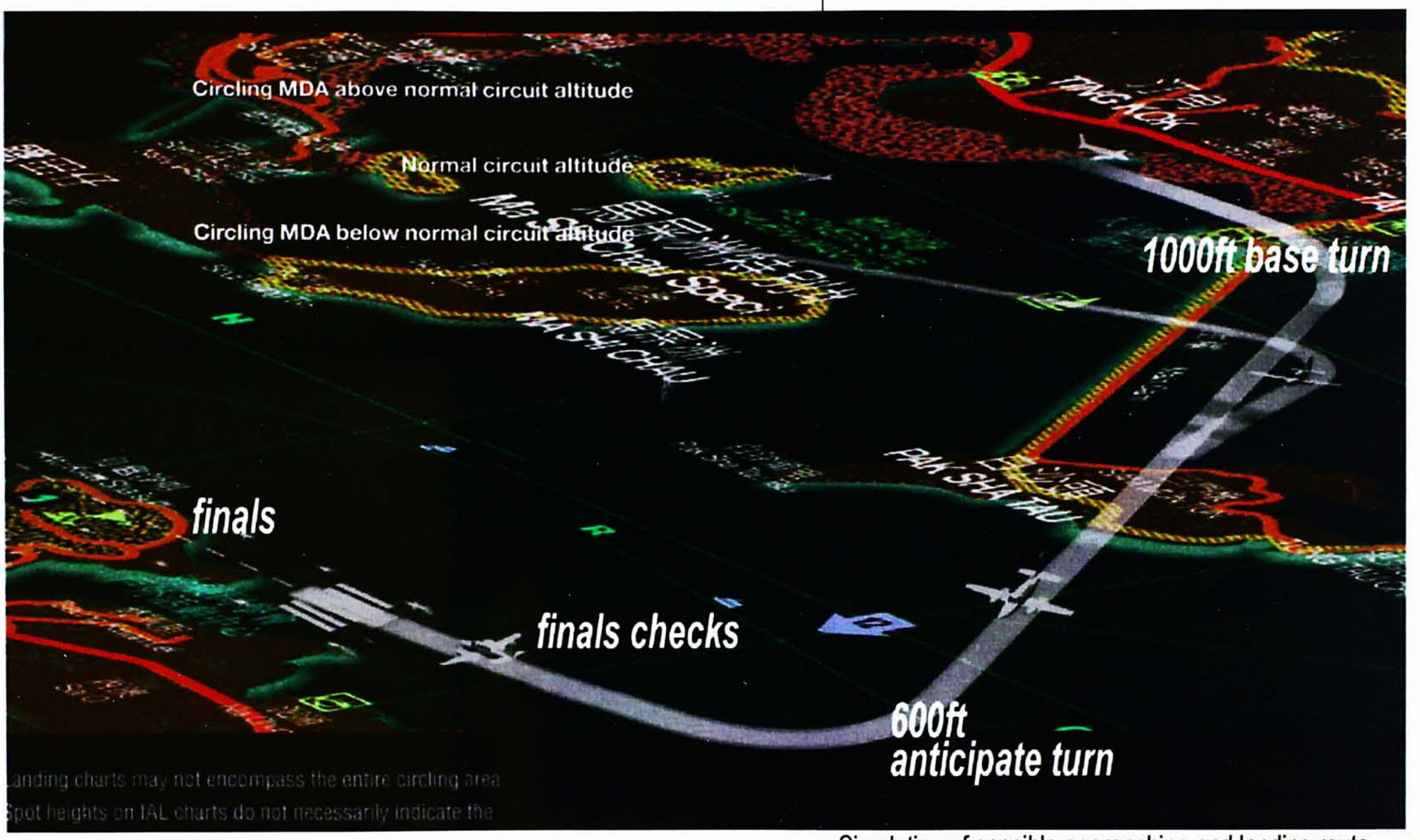
b. Circuit training and flying route



1. wind direction and terrain consideration
2. typical circuit training boundary
3. flying route to training airspace
4. minimum impact to residential district

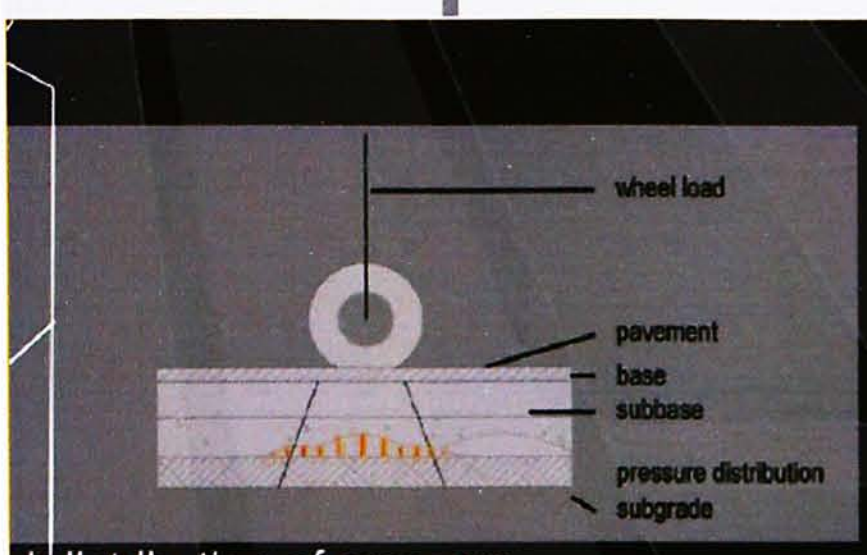
08design/ special studies

c. Approaching and landing

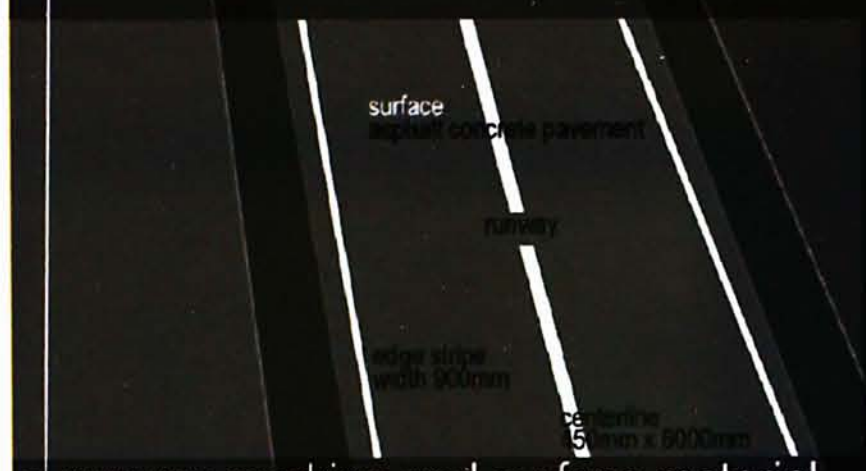


Simulation of possible approaching and landing route

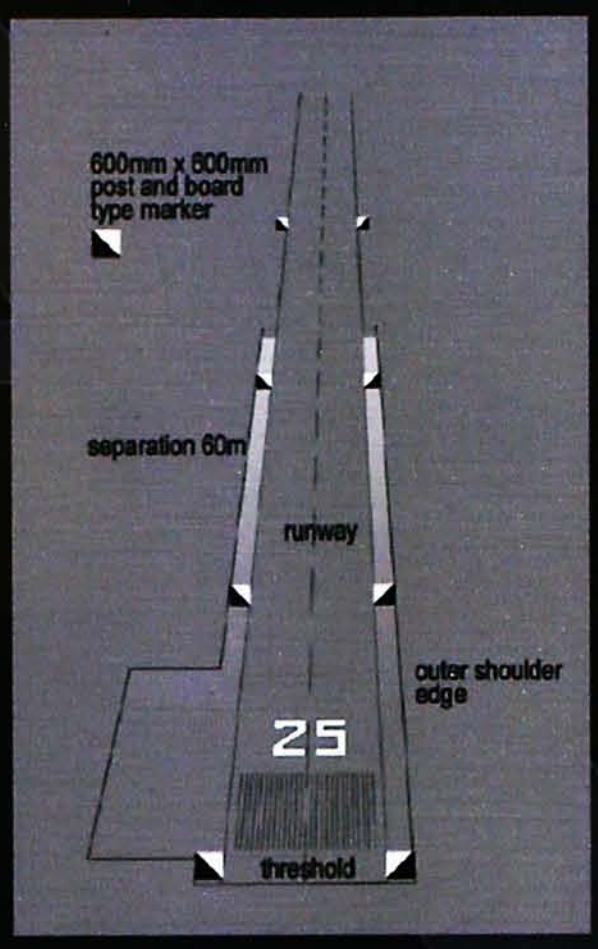
08design/ special studies



d. distribution of pressure under single-wheel loads



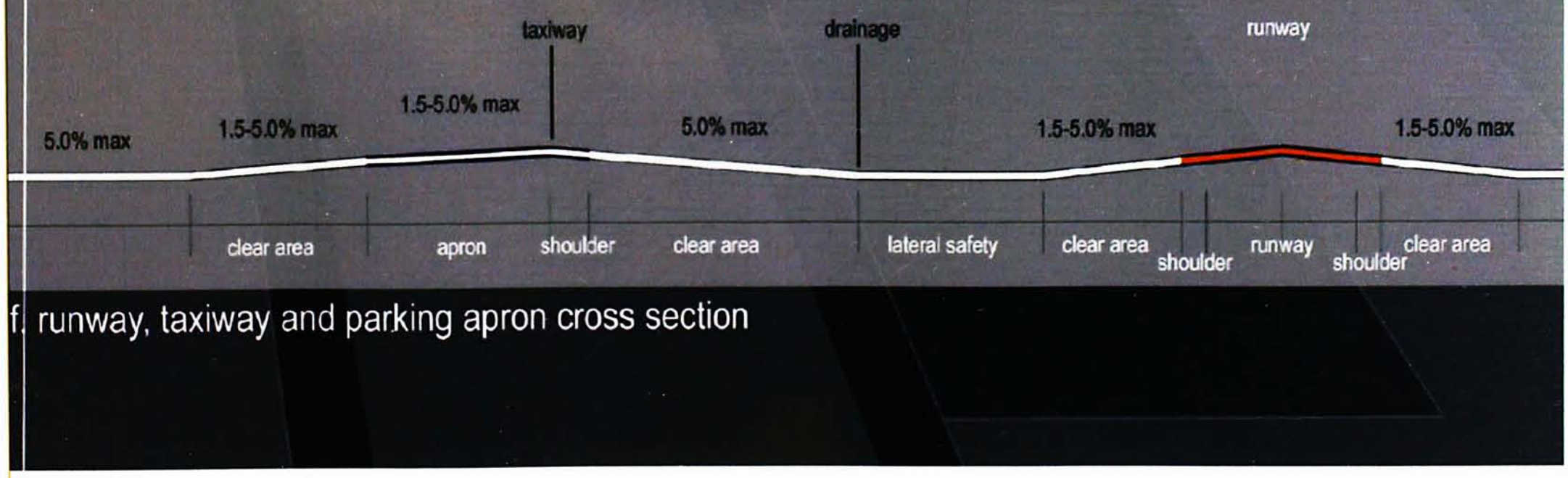
e. runway marking and surface material



g. runway marker placement

h. runway lighting layout

runway design special study



f. runway, taxiway and parking apron cross section

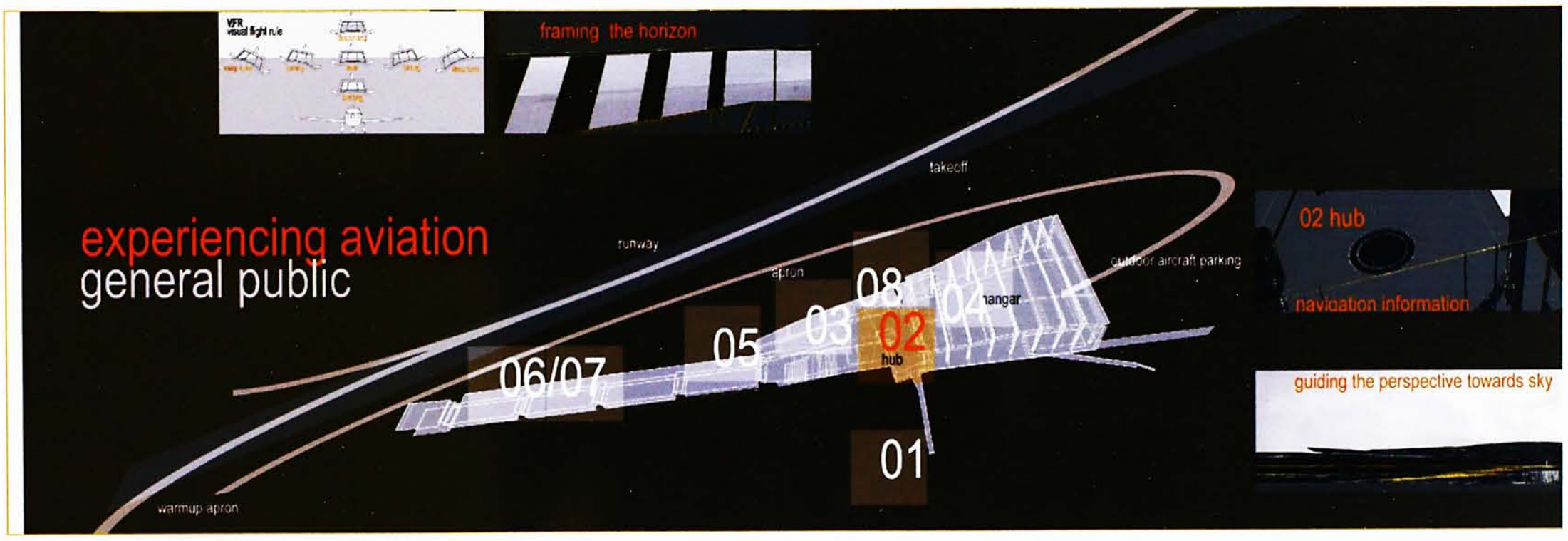
09

Design / general public experience

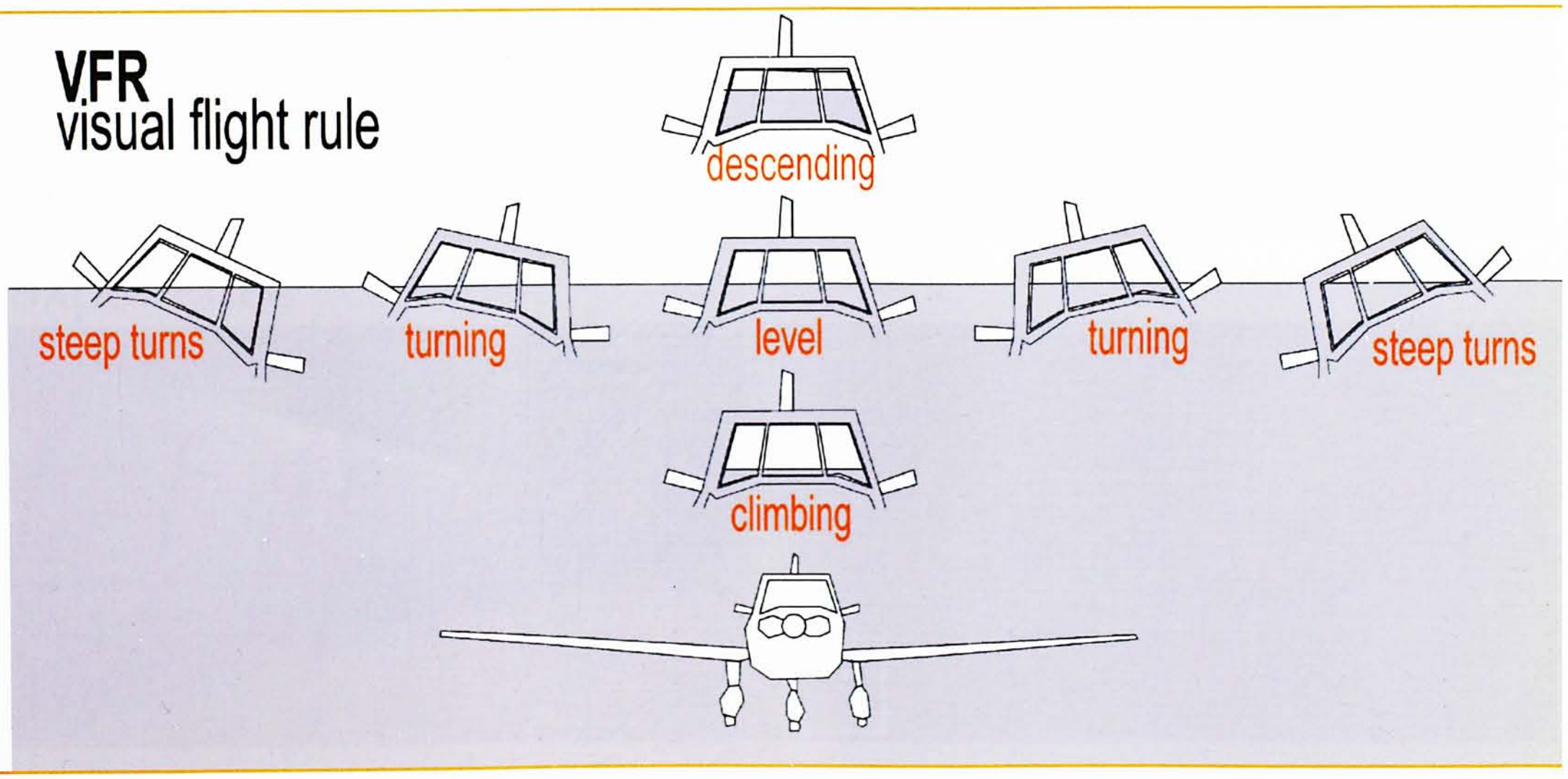
- Framing the horizon
- Entrance for general public
- Hub
- Connection
- Experiencing path

09design/ general public experience

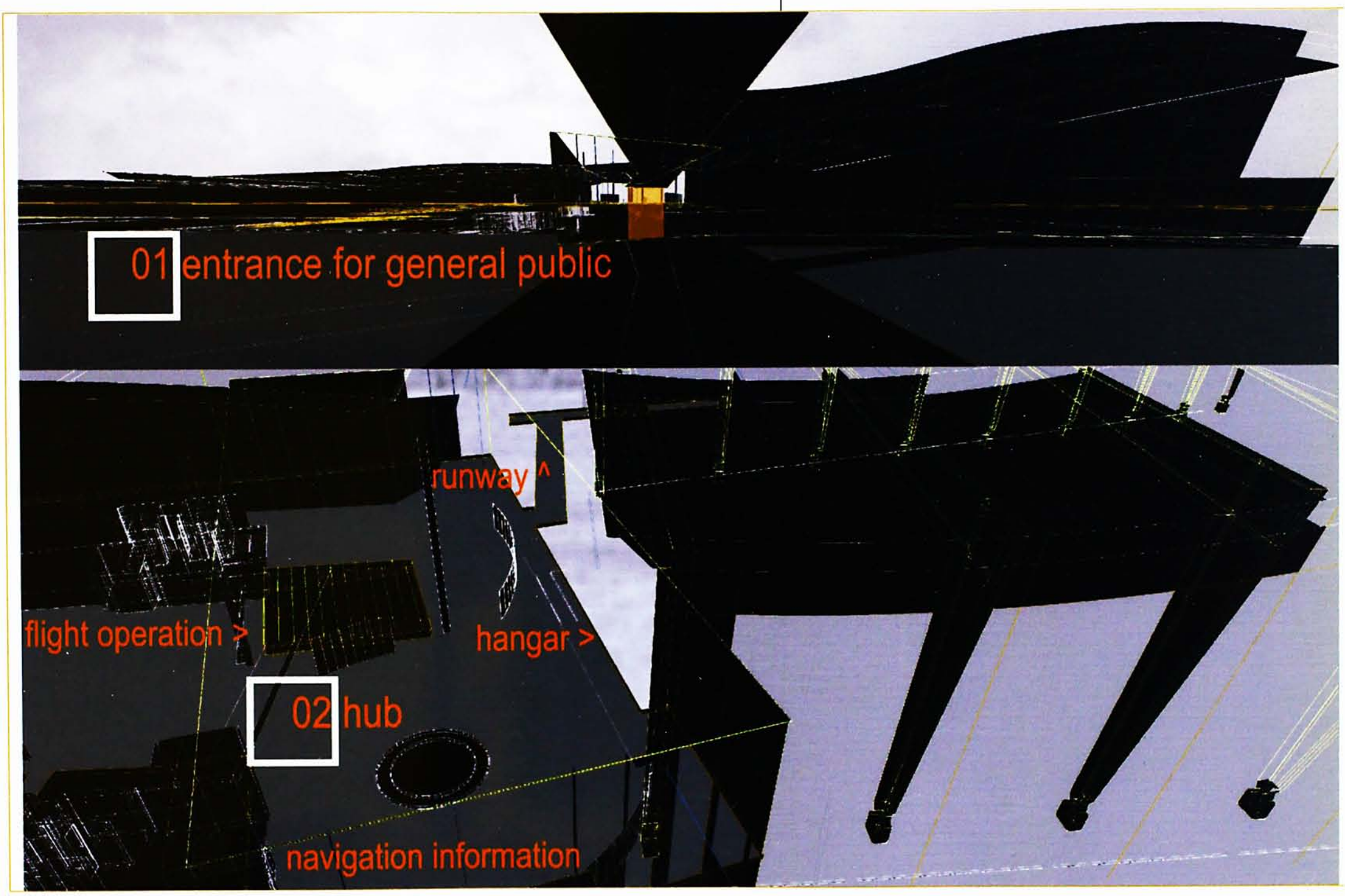
Framing the horizon



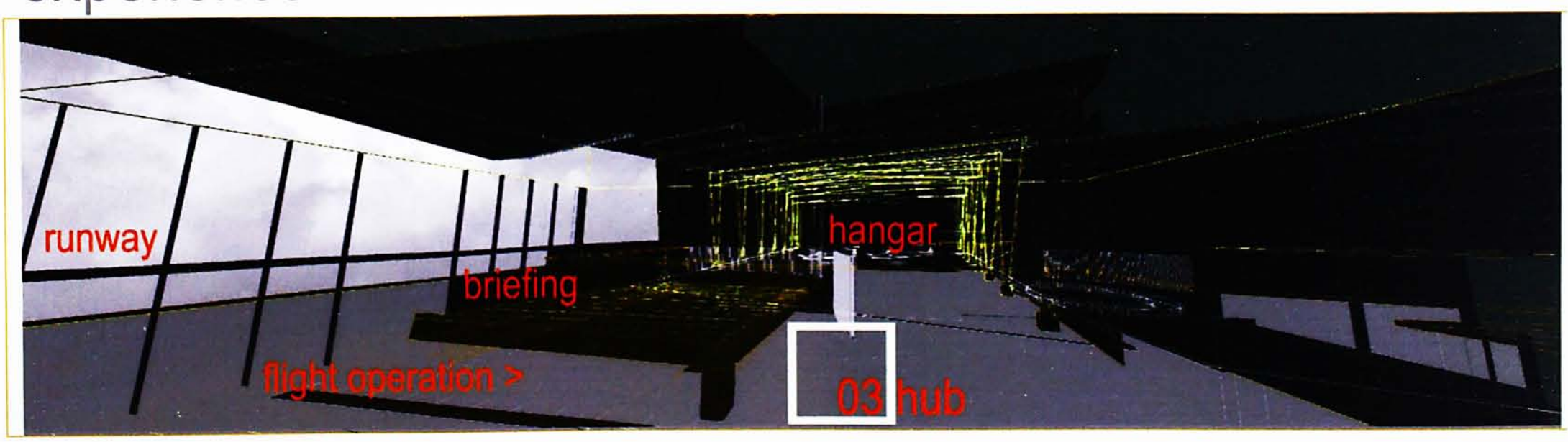
VFR visual flight rule



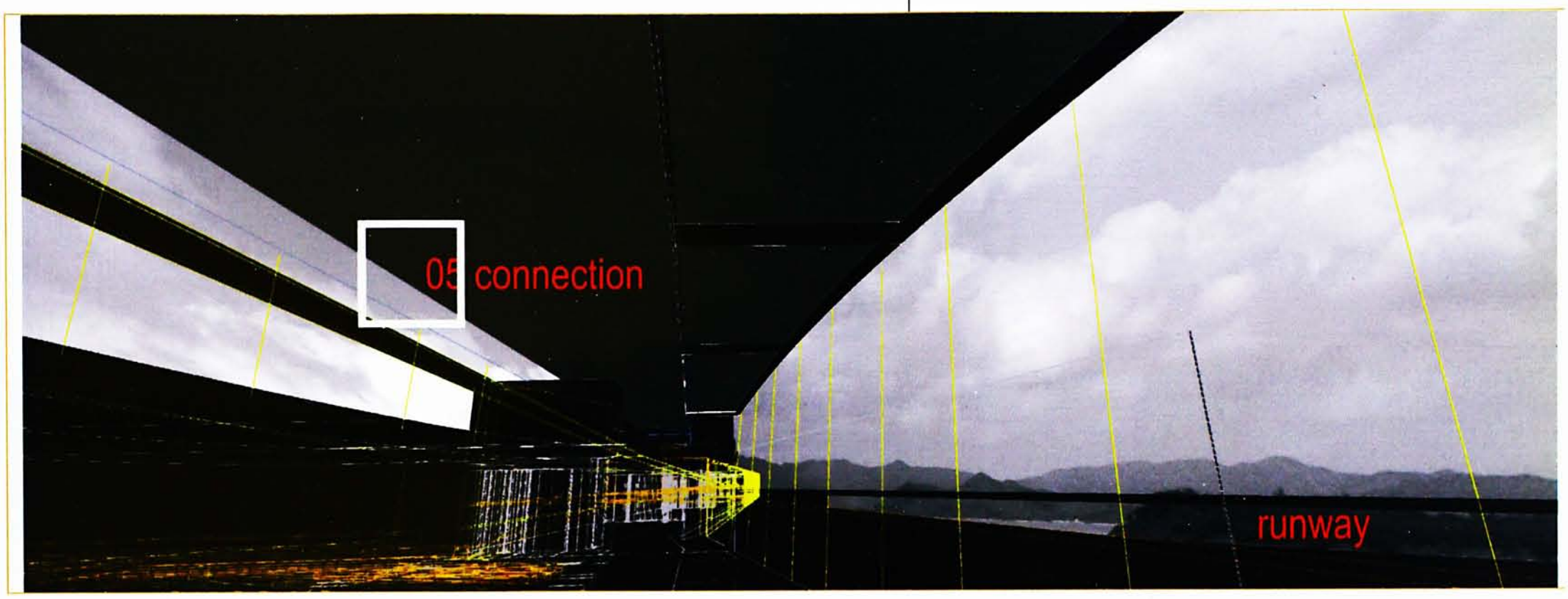
09design/ general public experience



experience



09design/ general public experience



observation

smelling

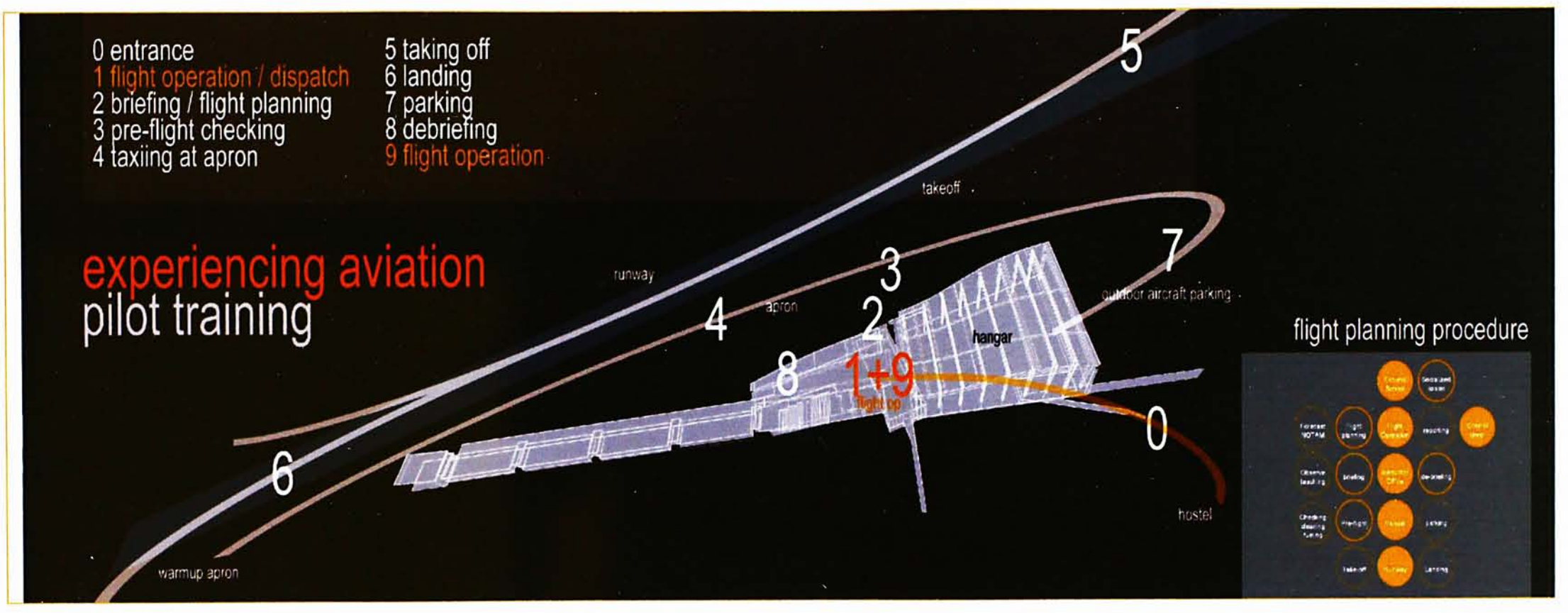
10

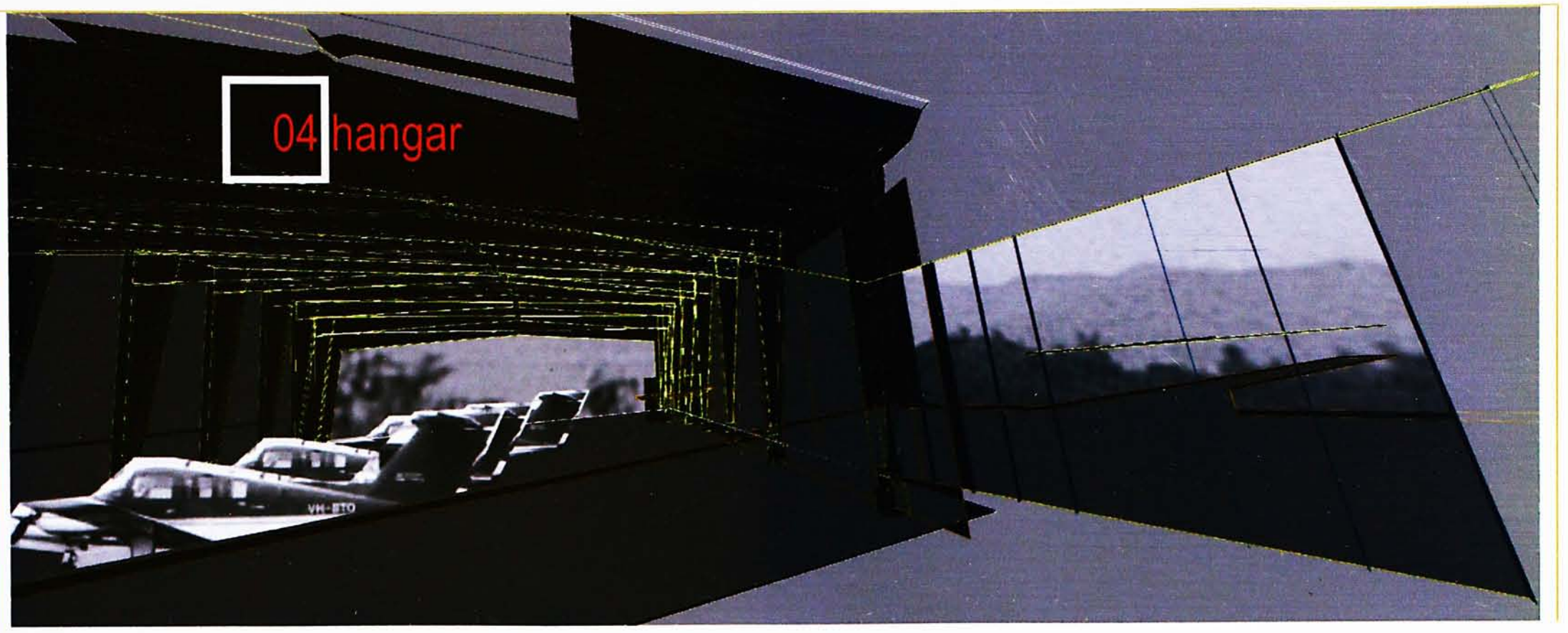
Design / **cadet pilot experience**

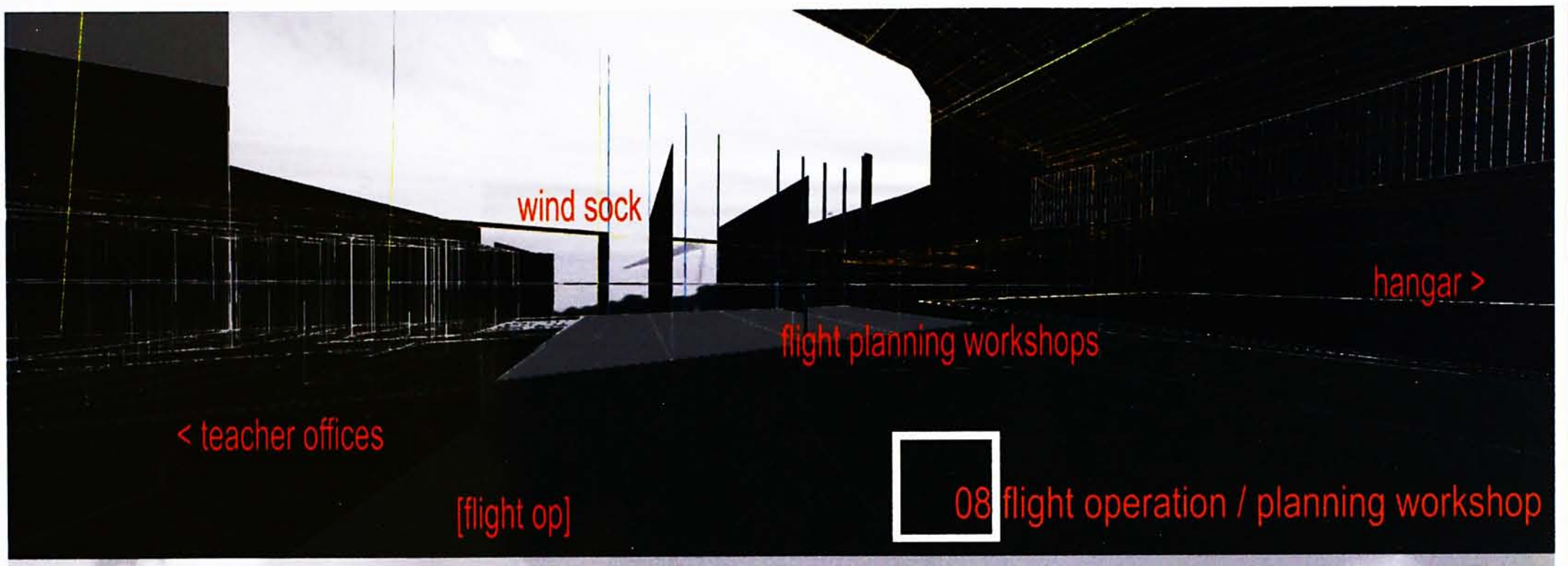
- Learning journey
- Hangar
- Flight operation / planning workshop
- Apron
- Experiencing path
- Aerial view

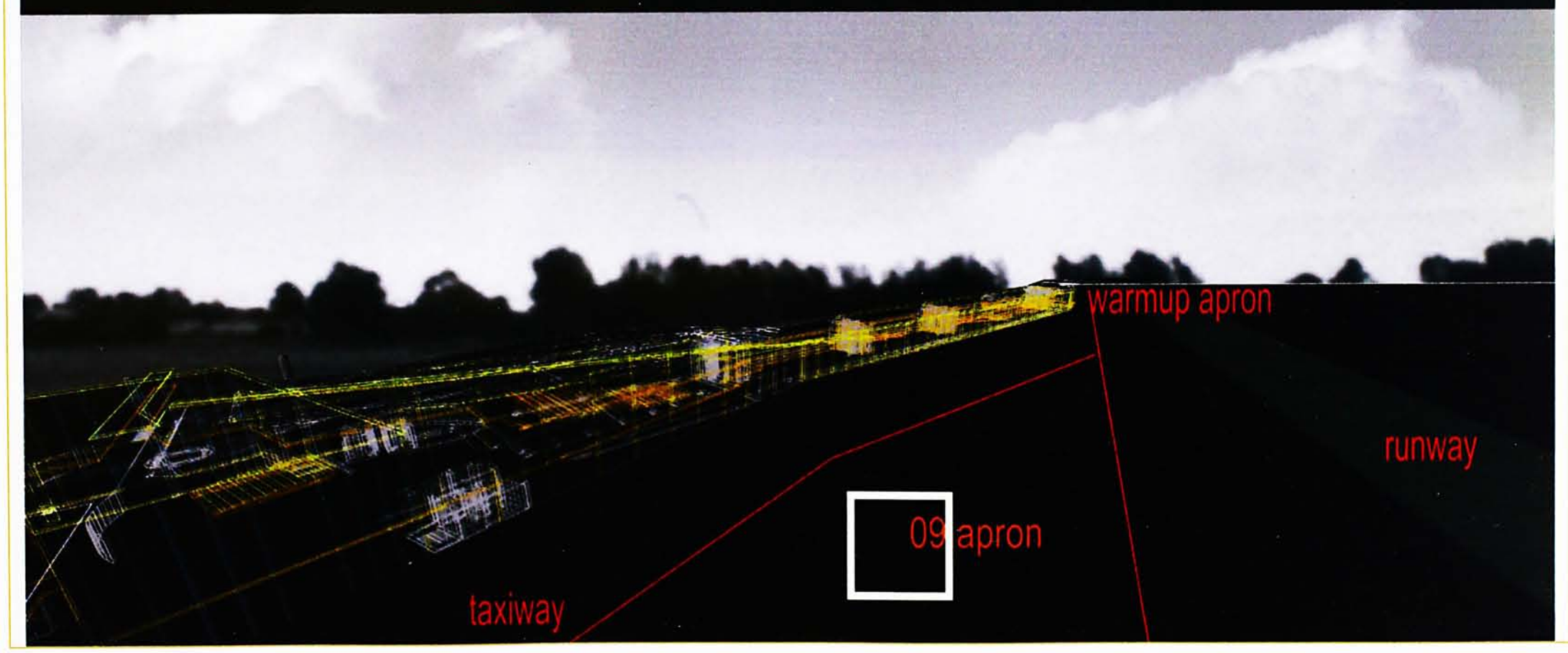
10design/ cadet pilot experience

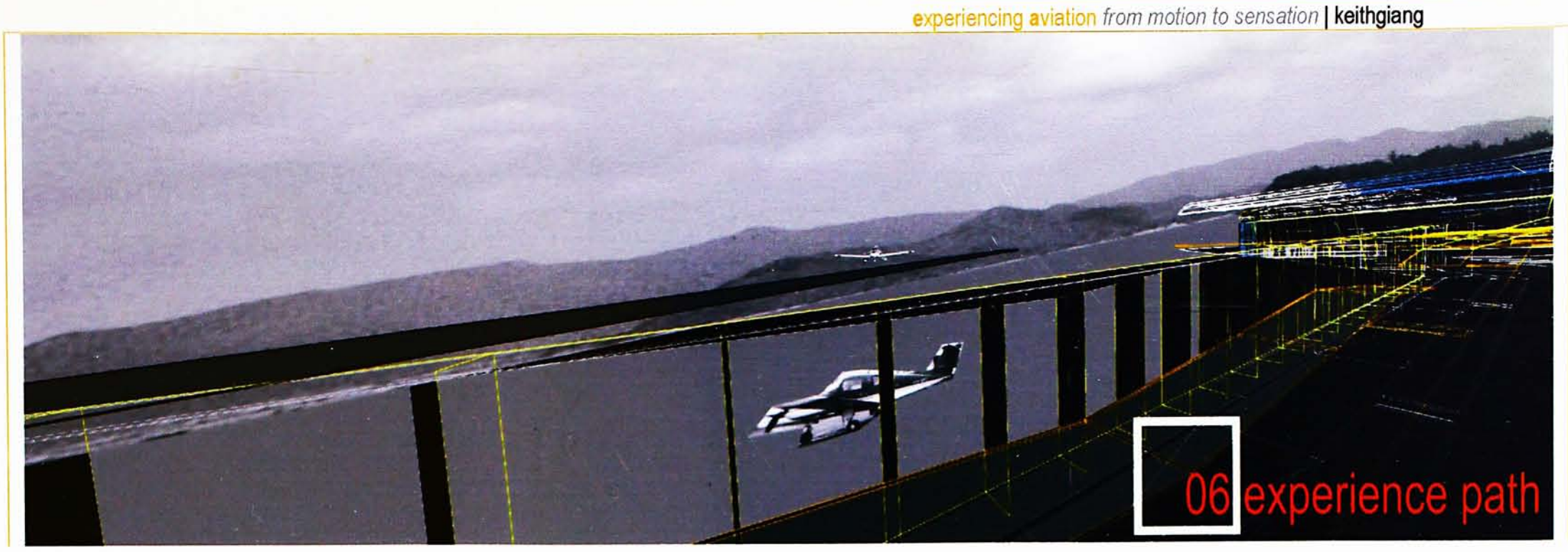
Learning journey

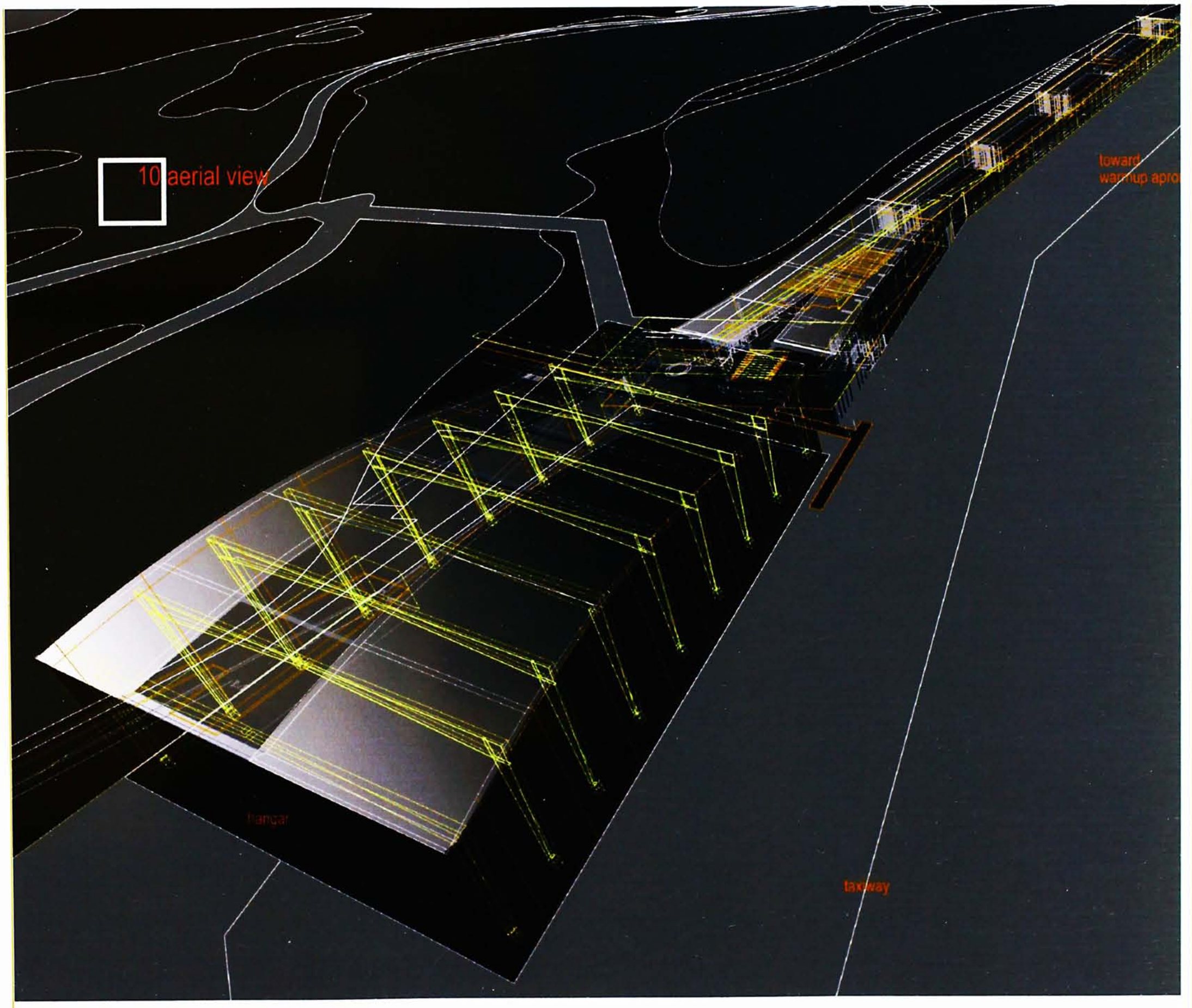



04 hangar


wind sock
hangar >
flight planning workshops
< teacher offices
[flight op]
08 flight operation / planning workshop


warmup apron
runway
09 apron
taxiway


06 experience path


10 aerial view
toward
warmup apro
hangar
taxiway

11schedule

August2001 | Theme proposal
3-20 September2001 | Tectonic laboratory
September2001 | Concept development, Research
11 October2001 | External Review (Theme, Concept, Site)

October2001 | Site selection and analysis, Runway consideration
8 November2001 | Internal Review (Program, Site, Mass)

November2001 | Prelim. design development
1 December2001 External Review (Prelim. design)

January2002 | Design Development
February2002 | Details Design
March2002 | Special Studies
20 April2002 Final Review | Final Presentation

10-12 May2002 Public Exhibition

Research + Design

12reference

Aviation motion as design genius

F.T. Marinetti, *The First Statement in the World of a New Italian Art; Aeropainting, Giornale delta Domenica*, Rome, 1-2 February 1931 (FUTURISM and FUTURISTS website http://www.futurism.org.uk/futurism.htm)

Sensation generated from aviation motion

1. **Drew Westen,** *Psychology Mind, Brain, & Culture*, New York : Wiley, c1996.
2. **Reinhart, Richard O.**, *Basic flight physiology*, New York: McGraw-Hill, c1996., second edition
3. **King, Raymond E.**, *Aerospace clinical psychology*, Aldershot, Hants, England ; Brookfield, Vt. : Ashgate, c1999.

Background of aviation, trends and training needs in Hong Kong

1. **K.-Y. Fung and Ted Pryor,** *Aviation conference 2000 : new career opportunities for Hong Kong, 19-20 September 2000 : conference proceedings*, Dept. of Mechanical Engineering, Hong Kong Polytechnic University, 2001
2. Civil Aviation Dept. HKSAR http://www.info.gov.hk/cad/index.htm
3. Cathay Pacific http://www.cathaypacific.com/hk
4. Dragonair http://www.dragonair.com.hk
5. HK Air Cadet Corps http://www.aircadets.org.hk/index.html
6. HK Aviation Club http://www.hkaviationclub.com.hk/
7. HK local flying chart of Hong Kong
8. 星期日檔案 - 2001/09/02(想飛)

Experiencing Aviation through architecture

1. A Pilot's Perspective on Airport Design / Wood Lockhurt **John Zukowsky,** Building for air travel : architecture and design for commercial aviation, Munich : Prestel ; Chicago, Ill. : Art Institute of Chicago, c1996.
2. Architecture in Motion: The Interior Design of Skylab / Rebecca Dalvesco **John Zukowsky, 2001 : building for space travel,** New York : Harry N. Abrams in association with the Art Institute of Chicago, 2001.
3. Bill Gunston, Aviation: the story of flight, Octopus, 1980
4. Interviewing Cathay Pacific pilot
5. Precedent study, Museum of flight, Sealtle

Sensation

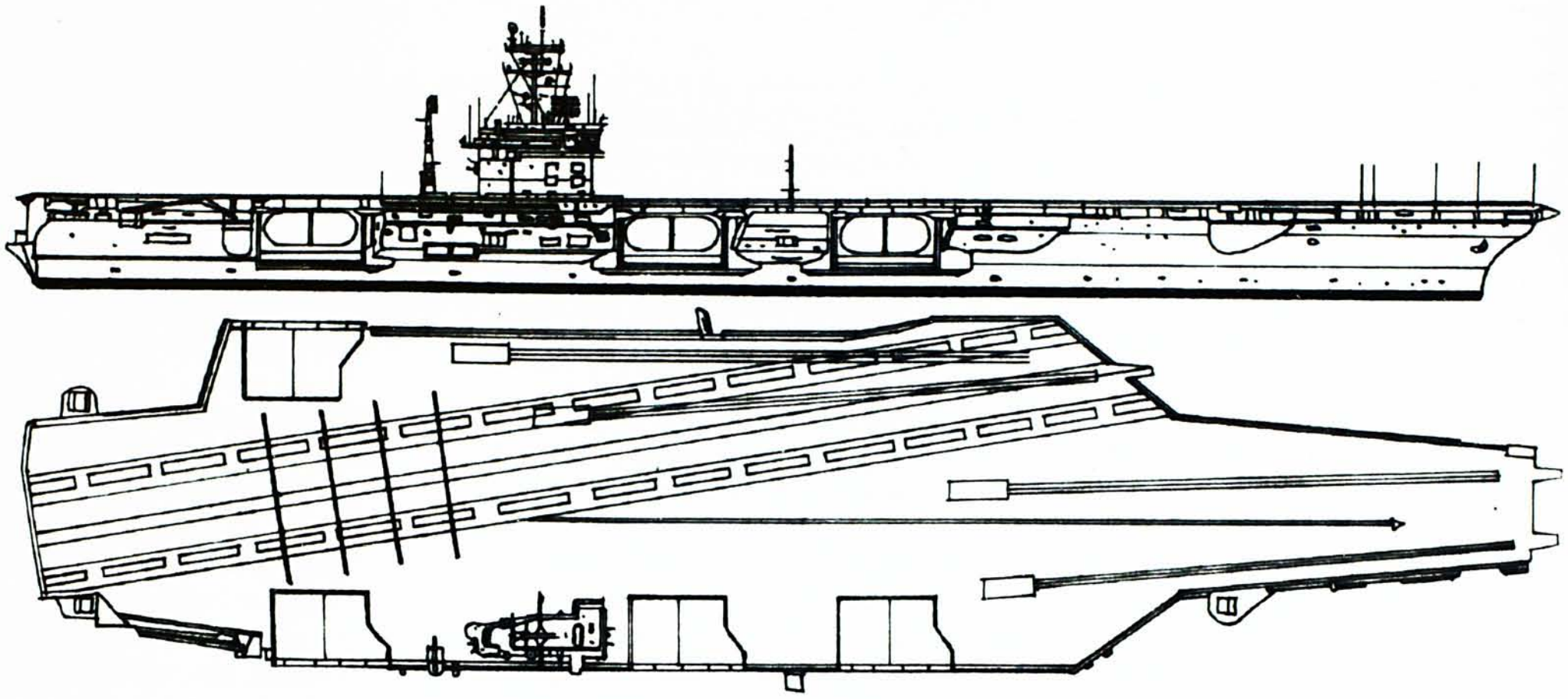
1. **El-Khoury, Rodolphe.,** *In visible environments : architecture and the senses in eighteenth-century France,*1996.
2. **Lloyd, Richard Earl.,** *Color sensation and the realizations of color on exterior architecture : an archival and experimental study of color perception, preference, and meaning*, 1988.
3. **Reinhard, Edgar.,** *Nomadic architecture : human practicality serves human emotion : exhibition design*, Nomadische Architektur. English, Baden, Switzerland: Lars Muller, c1998.
4. **Sweet, Fay.,** *Frog : form follows emotion / Fay Sweet.*,New York : Watson-Guptill, 1999.
5. **Vivoni Farage, Enrique.,** *A measure of silence : Louis I. Kahn and the transformation of the wall,*1985.

Others

1. **Wolf, Scott C,** *Karl Friedrich Schinkel : the tectonic unconscious and new science of subjectivity*, 1997.
2. **Kronenburg, Robert**, *Houses in motion : the genesis, history and development of the portable building*, London : Academy Editions, 1995.
3. **Alexander Tzonis,** *Santiago Calatrava The Poetics of Movement*, Thames & Hudson 1999

13appendix

[precedent study]
USS Nimitz, CBN71 class aircraft, 1972.



317m long, wrights 90,000 tons and is home to 5,500 crews.

The ultimate in lightweight, man-made structures are those associated with aviation. The endeavor to make machines that can be supported by the pressure of the air has been an ambition for many centuries. Yet of all the fundamental artifacts that have come to shape the twentieth century the flying machines has had the shortest and yet most dramatic history. In the space of just 66 years man went from the first heavier-than-air and lighter-then-air flying machine to the first successful journey to another planet.

As with the suspension bridge the Chinese played a fundamental role in the very early days of both heavier-than-air and lighter-than-air flight. The kite was invented in China over 2000 years ago and kite flying has been a popular pastime there for centuries. Although the Chinese developed kites that were sufficiently large to carry a man, the further exploitation of lightweight structures did not take place until the Renaissance, when between 1503 and 1506 Leonardo da Vinci carried out an extensive series of investigations into the nature of air and bird's method of flight. Leonardo's experiments with ornithopters failed but he was successful in developing a practical practical parachute. In the eighteenth century the first systematic practical experiments took place in England where Sir George Cayley developed the man-carrying glider.

insight

Possibility of designing space under the runway and providing new perspective of observation and experience.

13appendix

Stratton, Michael. ***Twentieth century industrial archaeology.*** **E & FN Spon, 2000.**

The manufacture of aircraft is a radically different industry from the production of motorcars, although it employs many of the same basic engineering techniques **Aircraft were only produced in large numbers in the two world wards of the twentieth century.** After the First World War the huge factories that had been constructed, and which where still being built at the time of the Armistice, were for the most part put to other uses. While British aircraft constructors, many of them imbued with achieved many notable technological innovation in the 1920s and 1930s, they gained scarcely any experience of mass production, nor was the remotely possible given the small numbers of most of the aircraft types of the period that were actually manufactured. Only eight examples were built of the HP42 airliner, the archetypal British aircraft of the 1930s. The mass production of aircraft and aero-engines during the second World War, as indicated above, was organized largely by firms accustomed to making motorcars which had gained experience of manufacture on a large scale.

In 1939 the RAF was operating 158 airfields, most of which still had grass runways. The need, first, to create fighter bases from which to repel the raids of the Luftwaffe and, second, to build concrete or tarmac runways form which four-engined bombers could attack Germany dictated a massive programme of airfield construction, which was accelerated which the entry into the war of US at the end of 1941.

Commercial air transport in Britain began on 25 August 1919 when a solitary passenger was flown from Hounslow Heath to Paris in a converted De Havilland 4A fighter belonging to Air Transport and Travel Ltd. Later in the day four passengers made the same journey in a De Havilland 16. Air travel in Britain in the 1920s was a minority pastime, a world of pageants and aerobatics, of grass runways and military surplus biplanes, or joyrides of the kind for which the first air ticket office, a wooden hut set up at Brooklands in 1911 and now part of the Brooklands Museum, is the symbol.

insight

Flying experience in the century has fulfilled the dream in our human history. It is already 100 years or so, but still stimulating.

13appendix

[precedent study]

Jenny Holzer has been at the forefront of American art since the early 1980s, gaining widespread recognition when texts from her Truisms series appeared on a vast electronic advertising board overlooking Times Square.
Holzer's real breakthrough, however, came in 1982, when she worked on a project for the Spectacolor sign in Times Square. This was the first time she used an electronic sign to display her texts. The signs have allowed her to reach a larger audience than she previously commanded. By programming them to run at varying speeds and in different typefaces, colors, and patterns, she is able to evoke nuances of meaning from seemingly matter-of-fact statements. Moreover, the signs are eminently suited to the device of repetition, which Holzer often uses with her swift, accessible consumerist language to engage the viewer in meaningful public discourse. She has also combined electronic signs with other mediums in her installations.

Diane Waldman. ***Jenny Holzer.*** **New York: Guggenheim Museum: H.N.Abrams, c1997. 2nd ed.**

The main façade, overlooking an open square, combines elements of picture and text. As at the Eberswalde Library a central theme is the importance of learning, and of the library in particular as the place in which students will acquire much of the knowledge they will need in their dealings with the world. This is indicated by glass panels onto which portraits of writers and scientists have been screen0printed, and by electronic screens that display quotations from works within the holdings of the two libraries. The two contrasting elements alternate like the layers of a cake. Whereas the portraits are static, animated at most by changes in the lighting of the rooms behind them, the electronic displays are constantly moving in a manner also found in the work of artists such as Jenny Holzer, In keeping with their medium, the quotations fluctuate – they are sometimes complete, sometimes truncated. If the pictures represent continuity, the words convey the passage of time and the cycle of temporal phases.

Mack, Gerhard. ***Eberswalde Library : Herzog & de Meuron.*** **Architectural Association, c2000.**

Their competition design for two libraries for the University of Jussieu in the center of Paris. The scheme envisages a modular, cohesive structure that orders the separate buildings around internal courtyards in a diverse yet fluid manner, so as to create distinct public and private areas.

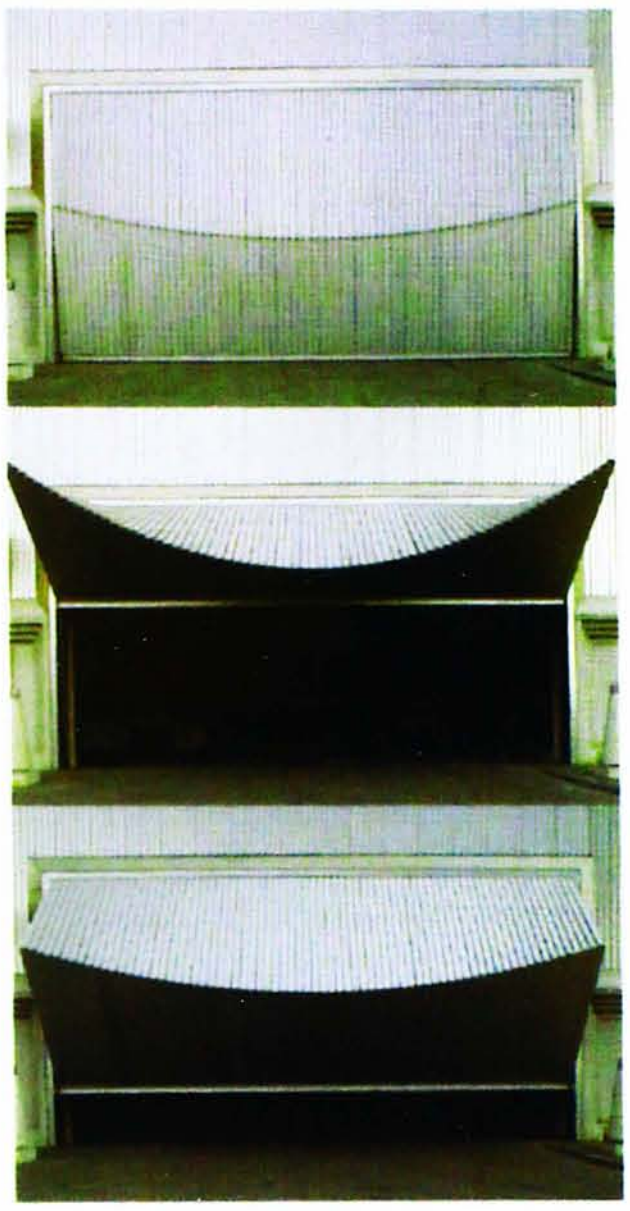
insight

How to transmit message to audience?
Do something unexpected or do something expected?

13appendix

[precedent study]

Ernsting Warehouse | Coefeld, Germany, 1983-85 | Santiago Calatrava



The rippled southern façade creates a rhythm of material and light invoking the playful, pulsating waves of light and shadow on the front of ancient Greek temples. The open doors assume the form of a graceful cantilevered roof, with the changes of geometry resembling a gently curving smile that breaks into laughter. Further associations emerge as each of the garage doors folds, rises, and extends like a human limb; when the doors are opened, the "knee" juts forward to provide a kind of protective canopy over the entrance. The canopy's swooping line and the gradual, uniform change of the position of the series of slats – lower at the sides, higher towards the center – provide a simple, functional, and wholly original solution to a potentially graceless technical element. Calatrava went on to patent the solution he created for this warehouse.

The Ernsting Warehouse is not only an example of counterintuitive and innovative technical performance. It is also an example of "dream-work": the fundamental transformation of a building's industrial, utilitarian typology to embrace new aesthetic experiences. The doors, or the undulating facing, for example, are more than merely functional; they are a technological metamorphosis of the building's envelop into a metaphor of the clothed body in movement. As metaphorical, anthropomorphic figures, the transformed moving doors smile, wink, bend a knee, raise a gown, and disclose both a gaping cavity and unexpected depth, while the façade, as a metaphor of curtain or dress, conceals or reveals the more subtle drama of the building.

insight The construction details could work with the idea of motion, light and shadow.

14
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experiencing aviation
from motion to sensation

design development

theme:from motion to sensation

concept:from aircraft motions

site options

fix flying chart

site:whitehead

runway design special study

a. consideration

b. orientation

c. circuit training

PORT SHELTER

01 entrance for general public

02 hub

runway

navigation information

to human sensation

from aircraft motion

experiencing aviation
pilot training

experiencing aviation
general public

experience path

training: the horizon

wind sock

flight operation : planning workshop

runway design special study

section a-a' 1:250

south elevation 1:250

services

circulation / egress

structure

flight planning workshop

whitehead
site plan 1:5000

experiencing aviation
first floor plan 1:250

flying school